

SERVICE MANUAL

MOYNO® 500 PUMPS

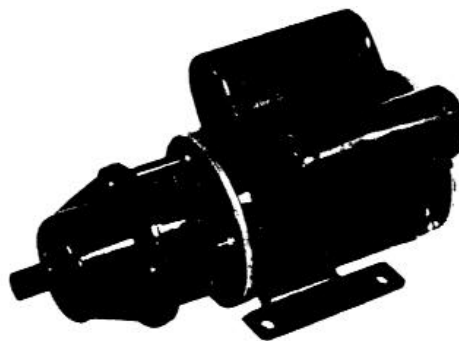
200 SERIES MOTORIZED

20352, 20452, 20551, 20552, 22051 AND 22052

MODELS

DESIGN FEATURES

Housing: AISI 316 stainless steel, or phenolic
 Pump Rotor: Phenolic, AISI 316 stainless steel
 Pump Stator: NBR (Nitrile)
 Seal: Mechanical (carbon/ceramic)
 Motor Shaft: AISI 316 stainless steel
 Motor: 115V AC, 1/8 HP, 50/60 Hertz, 1725 rpm,
 ball bearing, Class B insulation, capacitor
 start (other motor options available;
 consult Sales Representative)



Note: Alternate elastomers available. Refer to
 Repair/Conversion kit numbers, page 3.

INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings.

Pre-Wetting. Prior to connecting pump, wet pump elements and mechanical seal by adding fluid to be pumped into suction and discharge ports. Turn pump over several times in a clockwise direction using screwdriver slot in end of motor shaft.

Piping. Piping to pump should be self-supporting to avoid excessive strain on pump housings; 3/8" NPT pipe for suction, and, 1/4" NPT pipe for discharge on all metal housing models. 5/8" ID hose with hose clamp for suction and discharge ports of plastic housing models. Use pipe "dope" or tape to facilitate disassembly and to provide seal on pipe connections.

Electrical. Follow the wiring diagram on the motor nameplate or inside the terminal box for the proper connections. The wiring should be direct and conform to local electrical codes. Check power connections for proper voltage. Voltage variations must not exceed $\pm 10\%$ of nameplate voltage. Motor is provided with internal automatic overload protection.

To prevent damage to pump, pump rotation must be clockwise when facing pump from motor end.

OPERATION

Self-Priming. With wetted pumping elements, the pump is capable of 25 feet of suction lift with pipe size equal to port size. Be sure suction lines are air tight or pump will not self-prime.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity.

Pressure and Temperature Limits.

Maximum discharge pressure is 40 psig. Unit is suitable for service at temperatures shown in Table 1.

Storage. Always drain pump for extended storage periods by removing suction housing bolts and loosening suction housing.

Table 1. Temperature Limits

Elastomer	Temperature Limits
*NBR	10°-160°F
*EPDM	10°-210°F
*FPM	10°-240°F

*NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

TROUBLE SHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

Failure To Pump.

1. Motor won't start: Check power supply. Voltage must be $\pm 10\%$ nameplate rating when motor is in locked rotor condition. Do not use less than #14 wire size.
2. Motor runs and thermally kicks out: Increase ventilation to motor. Check for defective relay, or defective capacitor. Check for excessive pressure.
3. Stator torn; possibly excessive pressure: Replace stator, check pressure at discharge port.
4. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check discharge pressure for 40 psig maximum or obstruction in discharge line.
2. Fluid viscosity too high: Limit fluid viscosity to 100 CP or 500 SSU.

Noisy Operation.

1. Starved suction: Check fluid level, size of piping, and obstructions in pipe.
2. Bearings worn: Replace parts
3. Insufficient mounting: Mount securely. Reduce vibration induced noise by using a short section of hose on discharge piping.

Seal Leakage.

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Pump Will Not Prime.

1. Air leak on suction side: Check pipe connections.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

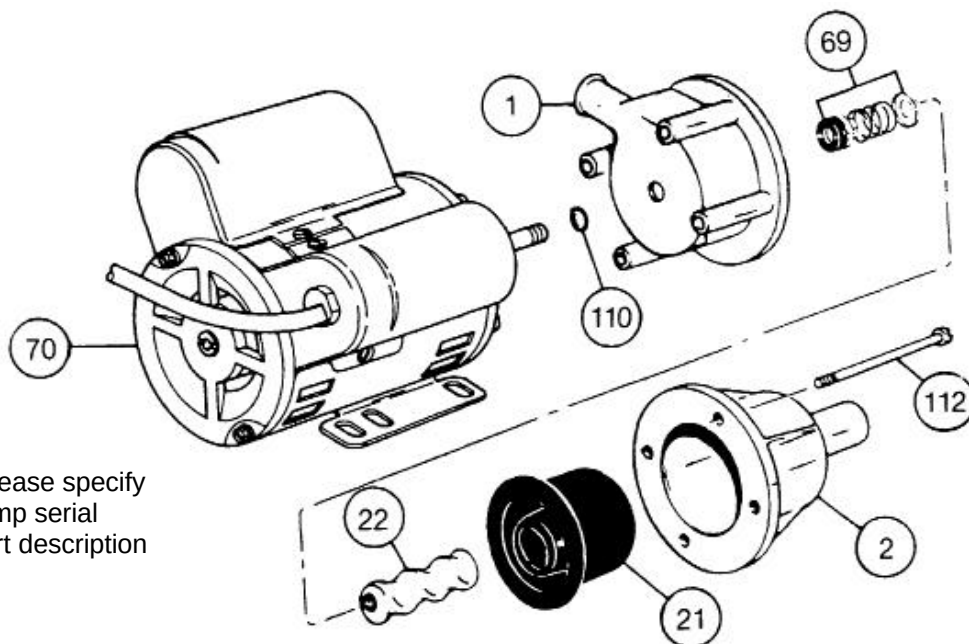
1. Remove suction and discharge piping.
2. Remove screws (112) holding suction housing (2) and pump body (1) to motor (70). Remove suction housing (2) and stator (21).
3. Remove rotor (22) from shaft by turning in a counterclockwise direction. Keep shaft from turning by inserting screwdriver in slotted end of motor shaft.
4. Remove slinger ring (110), pump body (1), and mechanical seal (69).
5. If any parts of the mechanical seal (69) are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.

PUMP ASSEMBLY

1. Slip slinger ring (110) over motor shaft. Place pump body (1) in position on motor (70).
2. Install mechanical seal (69) using the following procedure:
 - a. Clean and oil sealing faces using a clean light oil (not grease).

Caution: Do not use oil on EPDM parts. Substitute glycerin or soap and water.

- b. Oil the outer surface of the seal seat, and push the assembly into the seal bore in the pump body (1), seating it firmly and squarely.
 - c. After cleaning and oiling the shaft, slide the seal body along the shaft until it meets the seal seat.
 - d. Install seal spring and spring retainer on shaft.
3. Screw rotor (22) on shaft in a clockwise direction. Keep shaft from turning by inserting screwdriver in slotted end of motor shaft.
 4. Secure stator (21), suction housing (2), and pump body (1) to motor (70) using screws (112).
 5. Connect hose or piping and proceed as in installation instructions.



When ordering parts, please specify pump model number, pump serial number, part number, part description and quantity.

PARTS LIST

Item No.	Description	Pump Model Numbers					
		20352	20452	20551	20552	22051	22052
1	Pump Body	316 SS 330-3330-000		Phenolic 330-2953-000	316 SS 330-3330-000	Phenolic 330-2953-000	316 SS 330-3330-000
2	Suction Housing	316 SS 330-3327-000		Phenolic 330-2954-000	316 SS 330-3327-000	Phenolic 330-2954-000	316 SS 330-3327-000
*21	Stator	NBR 330-7555-120	NBR 330-7556-120	NBR 330-6381-120		NBR 330-6382-120	
*22	Rotor	316 SS 320-6975-000	316 SS 320-7923-000	Phenolic 320-6485-000	316 SS 320-6484-000	Phenolic 320-6488-000	316 SS 320-6487-000
*69	Mechanical Seal	NBR 320-6480-000					
70	Motor	330-4596-000					
110	Slinger Ring	320-2833-008					
112	Screws (4 req.)	619-0050-301					

*Recommended spare parts.

REPAIR/CONVERSION KIT NUMBERS (Not available as kit for 20352, 20452 Models)

Item No.	Description	205 Models			220 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
-	Kit No.	311-9116-000	311-9118-000	311-9120-000	311-9117-000	311-9119-000	311-9121-000
21	• Stator	330-6381-120	330-6381-320	330-6381-520	330-6382-120	330-6382-320	330-6382-520
69	• Seal	320-6480-000	320-6481-000	320-6482-000	320-6480-000	320-6481-000	320-6482-000

NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

Represented by: **Daparak, Inc.**

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SERVICE MANUAL

MOYNO® 500 PUMPS

200 SERIES

20302, 20402, 20501, 20502, 22001, 22002, 23201, AND 23203 MODELS

DESIGN FEATURES

Housing: Stainless steel or aluminum
Pump Rotor: Phenolic & AISI 316 stainless steel
Pump Stator: NBR (Nitrile)
Shaft: AISI 316 stainless steel
Bearings: Prelubricated, fully sealed ball bearings
Seal: Mechanical (carbon/ceramic)

Note: Alternate elastomers available. Refer to Repair/Conversion kit numbers, page 3.



INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings.

Pre-Wetting. Prior to connecting pump, wet pump elements and mechanical seal by adding fluid to be pumped into suction and discharge ports. Turn shaft over several times in a clockwise direction to work fluid into elements.

Piping. Piping to pump should be self-supporting to avoid excessive strain on pump housings; 3/8" NPT pipe used on 203, 204, 205 and 220 Models, and 1/2" NPT pipe used on 232 Models. Use pipe "dope" or tape to facilitate disassembly and to provide seal.

Drive. On belt driven units, adjust belt tension to point of non-slip. Do not overtighten. On direct drive units, coupling components should be aligned and spaced at least 1/16" apart.

Pump rotation must be clockwise when facing shaft to prevent rotor unscrewing from shaft. Check direction of rotation before startup.

Maximum speed is 1750 rpm.

OPERATION

Self-Priming. With wetted pumping elements, the pump is capable of 25 feet of suction lift when operating at 1750 rpm with pipe size equal to port size. Be sure suction lines are air tight or pump will not self-prime.

Note: Self-priming capabilities will vary depending on fluid viscosity.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity at a given rpm.

Pressure and Temperature Limits. Maximum discharge pressure is 40 psig. Unit is suitable for service at temperatures shown in Table 1.

Storage. Always drain pump for extended storage periods using pipe plug in pump body.

Table 1. Temperature Limits

Elastomer	Temperature Limits
*NBR	10°-160°F
*EPDM	10°-210°F
*FPM	10°-240°F

*NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

TROUBLE SHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm. Replace belt or coupling guards before reconnecting power.

Failure To Pump.

1. Belt or coupling slip: Adjust belt tension or tighten set screw on coupling.
2. Stator torn; possibly excessive pressure: Replace stator. Check pressure at discharge port.
3. Wrong rotation: Rotation must be clockwise when facing shaft.
4. Threads in rotor or on shaft stripped: Replace part. Check for proper rotation.
5. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check discharge pressure for 40 psig maximum or obstruction in discharge line.
2. Fluid viscosity too high: Limit fluid viscosity to 20,000 CP or 100,000 SSU.
3. Suction pressure should never be greater than discharge pressure.

Viscosity CP	Limit RPM
1-300	1750
300-1,000	1200
1,000-2,000	700
2,000-5,000	350
5,000-10,000	180
10,000-20,000	100

4. Insufficient motor HP: Check HP requirement.

Noisy Operation.

1. Starved suction: Check fluid level, size of piping, and obstructions in pipe.
2. Bearings worn: Replace parts.
3. Insufficient mounting: Mount securely. Reduce vibration induced noise by using a short section of hose on discharge piping.

Seal Leakage.

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Pump Will Not Prime.

1. Air leak on suction side: Check pipe connections.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Disconnect suction and discharge piping.
2. Remove screws (9) which secure suction housing (2) to pump body (1). Remove suction housing (2) and stator (3).
3. Rotor (4) is removed from shaft (5) by turning in a counterclockwise direction (R H thread).
4. If any parts of the mechanical seal (8) are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.

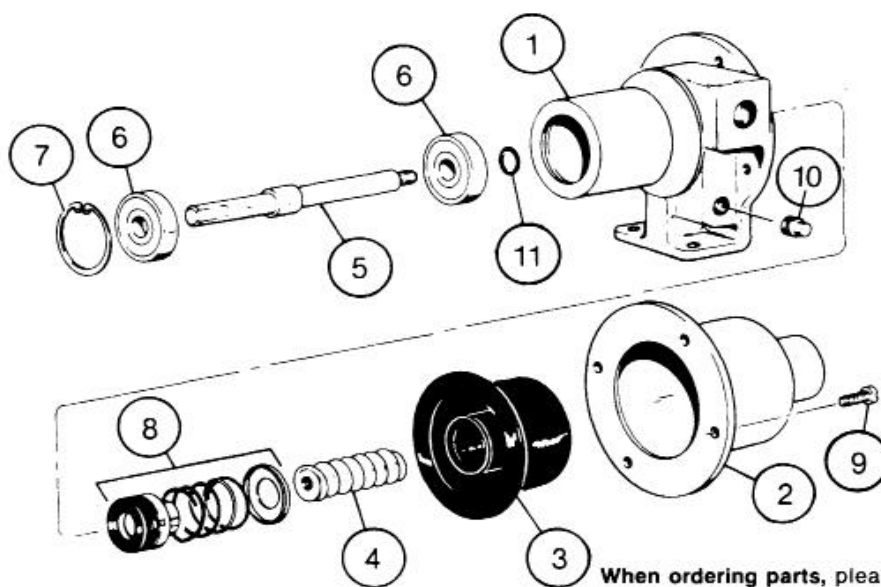
5. The bearings (6) and shaft (5) assembly can be removed from the pump body (1) after the snap ring (7) has been removed. To remove the assembly, tap the shaft at the threaded end using a block of wood to protect the threads. Pull slinger ring (11) from shaft. The bearings (6) may then be pressed off the shaft.

Note: When replacing bearings, always press on the inner race when assembling to shaft, and on the outer race when pressing bearings into the housings to prevent damage to the races.

PUMP ASSEMBLY

1. Press inboard bearing on shaft using inner race. Install slinger ring (11) on shaft. Press inboard bearing & shaft into pump body using outer race. Press outboard bearing on shaft and into pump body using both races. Secure with snap ring (7).
 2. Install mechanical seal (8) using the following procedure:
 - a. Clean and oil sealing faces using clean light oil (not grease).
- Caution: Do not use oil on EPDM parts. Substitute glycerin or soap and water.**
- b. Oil the outer surface of the seal seat, and push the assembly into the bore in the pump body (1), seating it firmly and squarely.
 - c. After cleaning and oiling the shaft, slide the seal body along the shaft until it meets the seal seat.
 - d. Install seal spring and spring retainer on shaft.
3. Screw rotor (4) on shaft (5) in a clockwise direction (R H thread).
 4. Secure stator (3) and suction housing (2) to pump body (1) with screws (9).
 5. Connect suction and discharge piping and proceed as outlined in installation instructions.

WARNING: Replace belt or coupling guards before reconnecting power.



When ordering parts, please specify pump model number, pump serial number, part number, part description and quantity.

PARTS LIST

Item No.	Description	Pump Model Numbers							
		20302	20402	20501	20502	22001	22002	23201	23203
1	Pump Body	316 SS 330-3328-001	316 SS 330-3328-001	Aluminum 330-3215-001	316 SS 330-3328-001	Aluminum 330-3215-001	316 SS 330-3328-001	Aluminum 330-3215-000	316 SS 330-3328-000
2	Suction Housing	316 SS 330-3327-000	316 SS 330-3327-000	Aluminum 330-2234-000	316 SS 330-3327-000	Aluminum 330-2234-000	316 SS 330-3327-000	316 SS 330-2233-000	316 SS 330-3329-000
*3	Stator	NBR 330-7555-120	NBR 330-7556-120	NBR 330-6381-120		NBR 330-6382-120		NBR 330-6385-120	
*4	Rotor	316 SS 320-6975-000	316 SS 320-7923-000	Phenolic 320-6485-000	316 SS 320-6484-000	Phenolic 320-6488-000	316 SS 320-6487-000	416 SS 320-6498-000	316 SS 320-6499-000
5	Drive Shaft	320-6489-000							
6	Bearing (2 req.)	630-0502-021							
7	Snap Ring	320-4211-000							
*8	Mechanical Seal	320-4215-000							
9	Screws (4 req.)	320-4787-006		619-0850-061	320-4787-006	619-0850-061	320-4787-006	619-0850-061	320-4784-006
10	Pipe Plug	610-0420-010							
11	Slinger Ring	320-2833-008							

*Recommended spare parts.

REPAIR/CONVERSION KIT NUMBERS (Not available as kit for 203, 204 Models)

Item No.	Description	205 Models			220 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
-	Kit No.	311-9061-000	311-9062-000	311-9063-000	311-9064-000	311-9065-000	311-9018-000
3	• Stator	330-6381-120	330-6381-320	330-6381-520	330-6382-120	330-6382-320	330-6382-520
8	• Seal	320-4215-000	320-6497-000	320-6037-000	320-4215-000	320-6497-000	320-6037-000
Item No.	Description	232 Models			NBR = Nitrile EPDM = Ethylene Proylene Diene Terpolymer FPM = Fluoroelastomer		
		NBR	EPDM	FPM			
-	Kit No.	311-9066-000	311-9067-000	311-9021-000			
3	• Stator	330-6385-120	330-6385-320	330-6385-520			
8	• Seal	320-4215-000	320-6497-000	320-6037-000			

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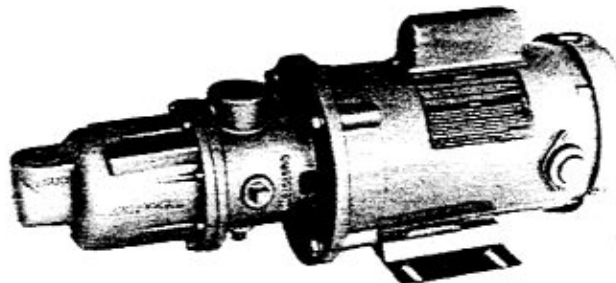
SERVICE MANUAL

MOYNO® 500 PUMPS

300 SERIES MOTORIZED 331, 332, 333, AND 344 MODELS

DESIGN FEATURES

Housing: Cast iron/316 SS
 Pump Rotor: Chrome plated AISI 416 stainless steel/Chrome plated 316 stainless steel
 Pump Stator: NBR (Nitrile)
 Seal: Mechanical (carbon/ceramic)
 Motor Shaft: AISI 416 stainless steel/ANSI 316 stainless steel
 Motor: 1/2 HP, 60 Hertz, 1725 rpm, totally enclosed, fan cooled (TEFC) C-Faced, 1 phase 115/230V or 3 phase 230/460V (other motor options available; consult sales representative)



Note: Alternate elastomers available. Refer to Repair/Conversion kit numbers pages 3 and 4.

INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings.

Pre-Wetting. Prior to connecting pump, wet pump elements and mechanical seal by adding fluid to be pumped into suction and discharge ports. Turn pump over several times in a clockwise direction to work fluid into pump elements.

Piping. Piping to pump should be self-supporting to avoid excessive strain on pump housings. See Table 1 for suction and discharge port sizes of each pump model. Use pipe "dope" or tape to facilitate disassembly and to provide seal on pipe connections.

Electrical. Follow the wiring diagram on the motor nameplate or inside the terminal box for the proper connections. The wiring should be direct and conform to local electrical codes. Check power connections for proper voltage. Voltage variations must not exceed $\pm 10\%$ of nameplate voltage. Motor is provided with internal automatic overload protection.

To prevent damage to pump, pump rotation must be clockwise when facing pump from motor end.

OPERATION

Self-Priming. With wetted pumping elements, the pump is capable of 25 feet of suction lift with pipe size equal to port size. Be sure suction lines are air tight or pump will not self prime. Self-priming capabilities will vary due to fluid viscosity.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity.

Pressure and Temperature Limits. See Table 1 for maximum discharge pressure of each model. Unit is suitable for service at temperatures shown in Table 2.

Storage. Always drain pump for extended storage periods by removing bottom drain plug in pump body.

Caution: Suction pressure should never be greater than discharge pressure.

Table 1. Pump Data

Pump Model	Suction Port (NPT)	Discharge Port (NPT)	Voltage Rating (VAC)	Discharge Pressure (psig)
331	3/4	3/4	See Motor Name Plate For Voltage Ratings	150
332	3/4	3/4	See Motor Name Plate For Voltage Ratings	100
333	3/4	3/4	See Motor Name Plate For Voltage Ratings	50
344	3/4	3/4	See Motor Name Plate For Voltage Ratings	†30

†With 3/4 HP motor, pressure is 40 psig.

Table 2. Temperature Limits

Elastomer	Temperature Limits
*NBR	10°-160°F
*EPDM	10°-210°F
*FPM	10°-240°F

*NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

TROUBLESHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system prior to disassembly. Failure to do so could lead to electric shock or serious bodily harm.

Failure To Pump.

1. Motor will not start: Check power supply. Voltage must be $\pm 10\%$ of nameplate rating when motor is in locked rotor condition. Check for faulty capacitor on 1 phase Models.
2. Motor runs and thermally kicks out: Check for excessive discharge pressure. Check for defective centrifugal switch on 1 phase Models. Increase ventilation to motor. Do not use less than #14 wire size.
3. Stator torn; possible excessive pressure: Replace stator, check pressure at discharge port.
4. Flexible joint broken; possible excessive pressure: Replace joint, check pressure at discharge port.
5. Wrong rotation (3 phase only): Rotation must be clockwise when facing pump from motor end. Reverse the connections of any two line leads to the motor.
6. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check pressure at discharge port for maximum ratings given in Table 1.
2. Fluid viscosity too high: Limit fluid viscosity to 100 CP or 500 SSU.

Noisy Operation.

1. Excessive suction lift or vacuum: Maximum suction lift is 25 feet for water.
2. Suction line too small: Check pipe size. Be sure lines are free from obstructions.
3. Pump Cavitates: Pump speed is 1725 rpm. Viscosity of fluid should not exceed 100 CP or 500 SSU.
4. Flexible joint worn: Replace joint. Check pressure at discharge port.
5. Insufficient mounting: Mount to be secure to a firm base. Vibration induced noise can be reduced by using mount pads and short sections of hose on suction and discharge ports.

Seal Leakage.

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Pump Will Not Prime.

1. Air leak on suction side: Check pipe connections.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Remove suction and discharge piping. Drain pump body by removing drain plug (261B).

2. Remove screws (112) holding suction housing (2) to discharge housing (1). Remove suction housing (2) and stator (21).
3. Remove rotor (22) from flexible joint (24) by turning counterclockwise (RH thread). On pinned, 3 phase models, remove rotor pin (45) with suitable punch.
4. Flexible joint (24) can be removed from motor shaft by using a 3/16 allen wrench in end of joint and turning counterclockwise. On 3 phase motors, remove motor pin (46) with suitable punch, then remove joint:
5. Slide mechanical seal (69) off motor shaft.
6. Remove discharge housing (1) from adaptor flange (12) by removing screws (1 12B).
7. Carefully pry seal seat out of discharge housing (1). If any parts of mechanical seal are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.
8. Remove adapter flange (12) from motor (70) by removing screws (112A).
9. Remove slinger ring (77).

PUMP ASSEMBLY

1. Install slinger ring (77).
2. Attach adaptor flange (12) to motor housing using screws (112A).
3. Attach discharge housing (1) to adaptor flange (12) using screws (112B). Be sure to center seal bore on shaft.
4. Install mechanical seal (69) in discharge housing (1) using the following procedure:
 - a. Clean and oil sealing faces using clean oil (not grease).

Caution: Do not use oil on EPDM parts. Substitute glycerin or soap and water.

- b. Oil outer surfaces of the seal seat, and push assembly over the motor shaft and into the discharge housing (1) seating it firmly and squarely.
 - c. After cleaning and oiling the shaft, slide the seal body along the motor shaft until it meets the seal seat.
 - d. Install seal spring and spring retainer on shaft.
5. Thread flexible joint (24) into motor shaft in a clockwise direction (RH thread). Tighten with 3/16 allen wrench. On 3 phase models, install motor pin (46).
 6. Thread rotor (22) onto flexible joint (24) in a clockwise direction (RH thread). On 3 phase models, install rotor pin (45).
 7. Slide stator (21) on rotor (22). On 331 & 332 models, insert rounded end of stator ring (135) into end of stator prior to installing stator on rotor.
 8. Secure stator (21) and suction housing (2) to discharge housing (1) using screws (112).
 9. Lubricate rotor and stator by filling Suction housing and discharge housing with fluid to be pumped.
 10. Connect Suction and discharge piping and power source.

PARTS LIST

To determine part numbers for all parts except standard motors, enter table with item number from pump illustration. Then locate part number under applicable model number (first three digits). Parts listed down the center are applicable to all pump models. To determine part numbers for standard motor (item 70), enter table at item 70 with the last two digits of model number: motor description and part number are on that line.

Item No.	Description	Pump Model Numbers			
		331	332	333	344
1	Discharge Housing	Cast Iron 350-1016-000/Stainless Steel 350-1016-007			
2	Suction Housing	Cast Iron 330-1064-002/Stainless Steel 330-1911-002			
*21	Stator	340-3501-120	340-3502-120	340-3503-120	340-3504-120
*22	Rotor (Threaded) 416 S5	320-2729-000	330-0906-000	320-1394-000	320-1841-000
*22	Rotor (Pinned) 416 SS	320-2729-004	320-4559-004	320-1584-002	320-1569-002
24	Flexible Joint (Threaded)	Carbon Steel 320-1511-000/Stainless Steel 320-3759-000			
240	Flexible Joint (Pinned)	Carbon Steel 320-1612-000/Stainless Steel 320-4415-000			
*45	Shaft Pin (2 req.)	320-4069-002			
*69	Mechanical Seal	320-2424-000			
70	Standard Motor				
	-59 1PH TEFC 1750 RPM	330-4529-000			
	-60 3PH TEFC 1750 RPM, Pin	330-4528-100			
	-52 1PH TEFC 1750 RPM	330-4529-1 00			
	-50 3PH TEFC 1750 RPM	330-4528-003			
77	Slinger Ring	320-6382-000			
112	Screw, Cap (8 req.)	Carbon Steel 619-1430-103 (10-24 x 5/8)/Stainless Steel 619-1432-120 (10-24 x 3/4)			
112A	Screw, Hex Hd (4 req.)	Carbon Steel 619-1530-161 (3/8-16 x 1)/Stainless Steel 320-6715-005 (3/8-16 x 1)			
135	Stator Ring	Carbon Steel 320-7812-000 /Stainless Steel 362-1774-000			
215	Lock Washer (8 req.)	320-6464-000			
215A	Lock Washer (4 req.)	Carbon Steel 623-0010-411/Stainless Steel 320-6717-002			
261	Pipe Plug, 1/4 NPT	Carbon Steel 610-0120-021/Stainless Steel 610-0420-020			
	Rotor (Threaded) 316 SS	320-2933-000	320-2942-000	320-2936-000	320-2934-000
	Rotor (Pinned) 316 SS	320-2933-002			

*Recommended spare parts.

Used on 3 phase models.

REPAIR/CONVERSION KIT NUMBERS

Item No.	Description	All 331 Models (Threaded Only)			All 332 Models (Threaded Only)		
		NBR	EPDM	FPM	NBR	EPDM	FPM
—	Kit No.	311-9026-000	311-9025-000	311-9054-000	311-9027-000	311-9038-000	311-9055-000
21	• Stator	340-3501-120	340-3501-320	340-3501-520	340-3502-120	340-3502-320	340-3502-520
24	• Joint	*320-1511-000	320-6367-000	320-4670-000	*320-1511-000	320-6367-000	320-4670-000
69	• Seal	320-2424-000	320-6379-000	320-6501-000	320-2424-000	320-6379-000	320-6501-000
Item No.	Description	All 333 Models (Threaded Only)			All 344 Models (Threaded Only)		
		NBR	EPDM	FPM	NBR	EPDM	FPM
—	Kit No.	311-9029-000	311-9028-000	311-9056-000	311-9031-000	311-9030-000	311-9057-000
21	• Stator	340-3503-120	340-3503-320	340-3503-520	340-3504-120	340-3504-320	340-3504-520
24	• Joint	*320-1511-000	320-6367-000	320-4670-000	*320-1511-000	320-6367-000	320-4670-000
69	• Seal	320-2424-000	320-6379-000	320-6501-000	320-2424-000	320-6379-000	320-6501-000

NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

*Carbon steel joint, for 316 SS joint use 320-3759-000.

REPAIR/CONVERSION KIT NUMBERS (CONT.)

		All 331 Models (Pinned Only)			All 332 Models (Pinned Only)		
Item No.	Description	NBR	EPDM	FPM	NBR	EPDM	FPM
—	Kit No.	311-9104-000	311-9108-000	311-9112-000	311-9105-000	311-9109-000	311-9113-000
21	• Stator	340-3501-120	340-3501-320	340-3501-520	340-3502-120	340-3502-320	340-3502-520
24	• Joint	*320-1612-000	320-6973-000	320-6984-000	*320-1612-000	320-6973-000	320-6984-000
69	• Seal	320-2424-000	320-6379-000	320-6501-000	320-2424-000	320-6379-000	320-6501-000
45	• Pin (2 req.)	320-4069-002			320-4069-002		
		All 333 Models (Pinned Only)			All 344 Models (Pinned Only)		
Item No.	Description	NBR	EPDM	FPM	NBR	EPDM	FPM
—	• Kit No.	311-9106-000	311-9110-000	311-9114-000	311-9107-000	311-9111-000	311-9115-000
21	• Stator	340-3503-120	340-3503-320	340-3503-520	340-3504-120	340-3504-320	340-3504-520
24	• Joint	*320-1612-000	320-6973-000	320-6984-000	*320-1612-000	320-6973-000	320-6984-000
69	• Seal	320-2424-000	320-6379-000	320-6501-000	320-2424-000	320-6379-000	320-6501-000
45	Pin (2 req.)	320-4069-002			320-4069-002		

ABRASION RESISTANT SEALS

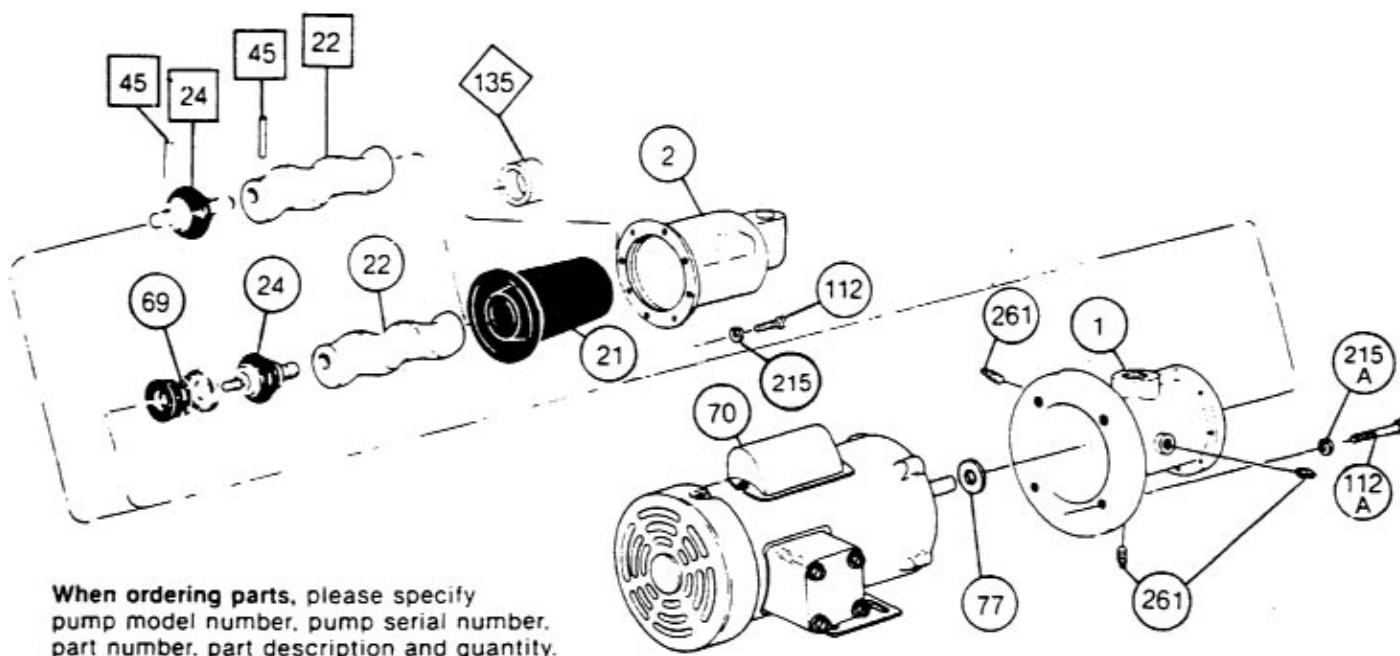
Elastomer	All 331 – 334 Models
NBR	320-6460-000
EPDM	320-6502-000
FPM	320-6503-000

NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

*Carbon steel joint, for 316 SS joint use 320-4415-000.



Used only on 331 & 332 Models.



Used on 3 Phase Models

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SERVICE MANUAL
MOYNO® 500 PUMPS
300 SERIES
331, 332, 333, 344, 356 AND 367 MODELS



Mechanical Seal Models



Packing Gland Models

DESIGN FEATURES	MODELS				
	33101 34401 33201 35601 33301 36701	33104 34404 33204 35604 33304 36704	33108 33308 33208 34408	34411 35611	35613
Housing:	Cast Iron	AISI 316 SS	Nylon	Cast Iron	AISI 316 SS
Pump Rotor:	Chrome plated 416 SS	Chrome plated 316 SS	Chrome plated 416 SS	Chrome plated 416 SS	Chrome plated 316 SS
Pump Stator:	NBR (Nitrile)	NBR (Nitrile)	NBR (Nitrile)	NBR (Nitrile)	NBR (Nitrile)
Shaft:	416 SS	316 SS	416 SS	416 SS	316 SS
Flexible Joint:	Carbon steel/ NBR	316 SS/ NBR	Carbon steel/ NBR	Carbon steel/ NBR	316 SS/ NBR
Bearings:	Ball (sealed)	Ball (sealed)	Ball (sealed)	Ball (sealed)	Ball (sealed)
Mechanical Seal:	Carbon-ceramic	Carbon-ceramic	Carbon-ceramic	---	---
Packing:	---	---	---	Braided PTFE	Braided PTFE

Note: Alternate elastomers available. Refer to Repair/Conversion kit numbers, page 8.

INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings.

Pre-Wetting. Prior to connecting pump, wet pump elements and mechanical seal or packing by adding fluid to be pumped into suction and discharge ports. Turn shaft over several times in a clockwise direction to work fluid into elements.

Piping. Piping to pump should be self-supporting to avoid excessive strain on pump housings. See Table 1 for suction and discharge port sizes of each pump model. Use pipe "dope" or tape to facilitate disassembly and to provide seal.

Drive. On belt driven units, adjust belt tension to point of non-slip. Do not overtighten.

On direct drive units, coupling components should be aligned and spaced at least 1/16" apart.

Pump rotation must be clockwise when facing shaft to prevent damage to pump. Check direction of rotation before startup.

Water Flush of Packing (356 Models Only). The packing may be either grease lubricated through a grease fitting in the stuffing box or have plumbing connected to the housing to allow a water flush.

Maximum speed is 1750 rpm.

When the material being pumped is abrasive in nature, it may be advantageous to flush the packing to prevent leakage under packing and excessive shaft wear.

Clean water can be injected through a 1/8" NPT tapped hole that normally houses the grease fitting for lubricating the packing. The water can be permitted to leak axially along the shaft in either direction or can be removed from the second tapped hole in the stuffing box. In both cases, the discharge from the stuffing box should be throttled slightly to maintain 10-15 PSI higher pressure in the stuffing box than is present in the discharge housing.

Table 1. Pump Data

Pump Models	331	332	333	344	356	367
Suction Port (NPT)	3/4*	3/4*	3/4*	3/4*	1-1/2	2
Discharge Port (NPT)	3/4	3/4	3/4	3/4	1-1/4	2
Discharge Pressure (psig)	150	100	50	40	50	50

*08 versions = 1" NPT

Table 2. Temperature Limits

Elastomer	Temperature Limits
*NBR	10°-160°F
*EPDM	10°-210°F
*FPM	10°-240°F

*NBR = Nitrile

*EPDM = Ethylene-Propylene-Diene Terpolymer

*FPM = Fluoroelastomer

OPERATION

Self-Priming. With wetted pumping elements, the pump is capable of 25 feet of suction lift when operating at 1750 rpm with pipe size equal to port size.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity.

Pressure and Temperature Limits. See Table 1 for maximum discharge pressure of each model. Unit is suitable for service at temperatures shown in Table 2.

Storage. Always drain pump for extended storage periods by removing suction housing bolts and loosening suction housing.

TROUBLE SHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

Failure To Pump.

1. Belt or coupling slip: Adjust belt tension or tighten set screw on coupling.
2. Stator torn; possibly excessive pressure: Replace stator, check pressure at discharge port.
3. Wrong rotation: Rotation must be clockwise when facing shaft.

4. Threads in rotor or on shaft stripped: Replace part. Check for proper rotation.
5. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check discharge pressure for maximum rating given in Table 1. Check for obstruction in discharge pipe.
2. Fluid viscosity too high: Limit fluid viscosity to 20,000 CP or 100,000 SSU.

Viscosity CP	Limit RPM
1-300	1750
300-1,000	1200
1,000-2,000	700
2,000-5,000	350
5,000-10,000	180
10,000-20,000	100

3. Insufficient motor HP: Check HP requirement.

Noisy Operation.

1. Starved suction: Check fluid supply, length of suction line, and obstructions in pipe.
2. Bearings worn: Replace parts; check alignment, belt tension, pressure at discharge port.
3. Broken flexible joint: Replace part, check pressure at discharge port.
4. Insufficient mounting: Mount to be secure to firm base. Vibration induced noise can be reduced by using mount pads and short sections of hose on suction and discharge ports.

Mechanical Seal Leakage (Mechanical Seal Models Only).

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Packing Leakage (Packing Models Only).

1. Leakage at startup: Adjust packing as outlined in maintenance instructions.

Note: Slight leakage is necessary for lubrication of packing.

2. Persistent leakage: Packing rings and/or shaft may be worn. Replace parts as required.

Pump Will Not Prime.

1. Air leak on suction side: Check pipe connections.

MAINTENANCE

General. These pumps have been designed for a minimum of maintenance, the extent of which is routine lubrication and adjustment of packing. The pump is one of the easiest to work on in that the main elements are very accessible and require few tools to disassemble.

Packing Lubrication (356 Models Only). The zerk fitting on the side of the suction housing leads to the lantern ring halves in the mid-section of the packings. At least once a week, inject a small quantity of good quality grease, such as MPG-2 Multi Purpose Grease (Du Bois Chemical), or equivalent, into the zerk fitting to lubricate the packings.

Note: For Model 34411, lubricate packing by applying a liberal amount of grease during assembly.

Packing Adjustment (Packing Models Only).

Packing gland attaching nuts should be evenly adjusted so they are little more than finger tight. Over-tightening of the packing gland may result in premature packing failure and possible damage to the shaft and gland.

When the packing is new, frequent minor adjustments are recommended for the first few hours of operation in order to compress and seat the packing. Be sure to allow slight leakage for lubrication of packing.

When excessive leakage can no longer be regulated by tightening the gland nuts, remove and replace the packings in accordance with the DISASSEMBLY and REASSEMBLY instructions. The entire pump need not be disassembled to replace the packings.

Bearing Lubrication. The prelubricated, fully sealed bearings do not require additional lubrication.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

To Disassemble Mechanical Seal Models:

1. Disconnect suction and discharge piping.
2. Remove screws (112) holding suction housing (2) to pump body (1). Remove suction housing and stator (21).
3. Remove rotor (22) from flexible joint (24) by turning counter-clockwise (RH thread). Use 3/16 inch diameter punch to remove rotor pin (45) on Model 36701.
4. Flexible joint (24) can be removed from shaft (26) by using a 3/16 inch allen wrench in end of joint (1/4 inch wrench on 356 Models) and turn counter-clockwise. Use 3/16 inch diameter punch to remove shaft pin (46) on Model 36701.
5. Carefully slide mechanical seal (69) off shaft (26). Carefully pry seal seat out of pump body (1). If any parts of mechanical seal are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.
6. The bearings (29) and shaft (26) assembly can be removed from pump body (1) after snap ring (66) has been removed. To remove the assembly, lightly tap the shaft at threaded end using a block of wood to protect the threads. The bearings may be pressed off the shaft.

To Disassemble Packing Models:

1. Disconnect suction and discharge piping.
2. Remove screws (112) which hold suction housing (2) to pump body (1). Remove suction housing and stator (21).
3. Remove rotor (22) from flexible joint (24) by turning in a counter-clockwise direction (RH thread).
4. Flexible joint (24) can be removed by using a 3/16 inch allen wrench in end of joint (1/4 inch wrench on 356 Models) and turn in a counter-clockwise direction.
5. The packing (42) can be removed without removing the shaft (26) using the following procedure:
 - a. Remove gland bolts (47).
 - b. Slide gland (41) away from packing (42).
 - c. Pull out packing (42) (and lantern ring halves (57) on 356 Models) using a packing removing tool.

Note: Packing can be removed after shaft has been removed by pushing out from pump side of pump body after gland (41) has been detached.

6. The bearings (29) and shaft (26) assembly can be removed from pump body (1) after snap ring (66) has been removed. To remove the assembly, lightly tap the shaft at threaded end using a block of wood to protect the threads.
7. To disassemble shaft assembly, remove snap ring (66A) from shaft (26) and press bearings (29) and bearing spacer (33) off the shaft.

PUMP ASSEMBLY**To Assemble Mechanical Seal Models:**

1. Press bearings (29) on shaft (26), and locate slinger ring (77) near bearing on threaded end of shaft.

Note: When replacing bearings, always press on the inner race when assembling to shaft, and on the outer race when pressing bearings into the housings.

2. Press shaft assembly into pump body (1) securing with snap ring (66).
3. Install mechanical seal (69) using the following procedure:
 - a. Clean and oil sealing faces using a clean light oil (not grease).

Caution: Do not use oil on EPDM parts. Substitute glycerin or soap and water.

- b. Oil the outer surface of the seal seat, and push the assembly into the bore in the pump body (1), seating it firmly and squarely.
 - c. After cleaning and oiling the shaft, slide the seal body along the shaft until it meets the seal seat.
 - d. Install seal spring and spring retainer on shaft.
4. Thread flexible joint (24) into shaft (26) in a clockwise direction (RH thread). On 356 Models, install seal spacer (69A) and washer (116) before threading flexible joint onto shaft in a clockwise direction. On Model 36701, use shaft pin (46) to pin flexible joint (24) to shaft.
 5. Thread rotor (22) onto flexible joint (24) in a clockwise direction (RH thread). On Model 36701, pin rotor (22) to joint using rotor pin (45).
 6. Slide stator (21) on rotor (22). On 331 and 332 Models, insert rounded end of stator ring (135) into end of stator prior to installing stator on rotor.
 7. Secure stator (21) and suction housing (2), with suction port vertically up, to pump body (1) using screws (112).
 8. Proceed as in installation instructions.

To Assemble Packing Models:

1. Press bearings (29), with bearing spacer (33) in between, on shaft (26) and secure in place using snap ring (66A).

Note: When replacing bearings, always press on the inner race when assembling to shaft, and on the outer race when pressing bearings into the housings.

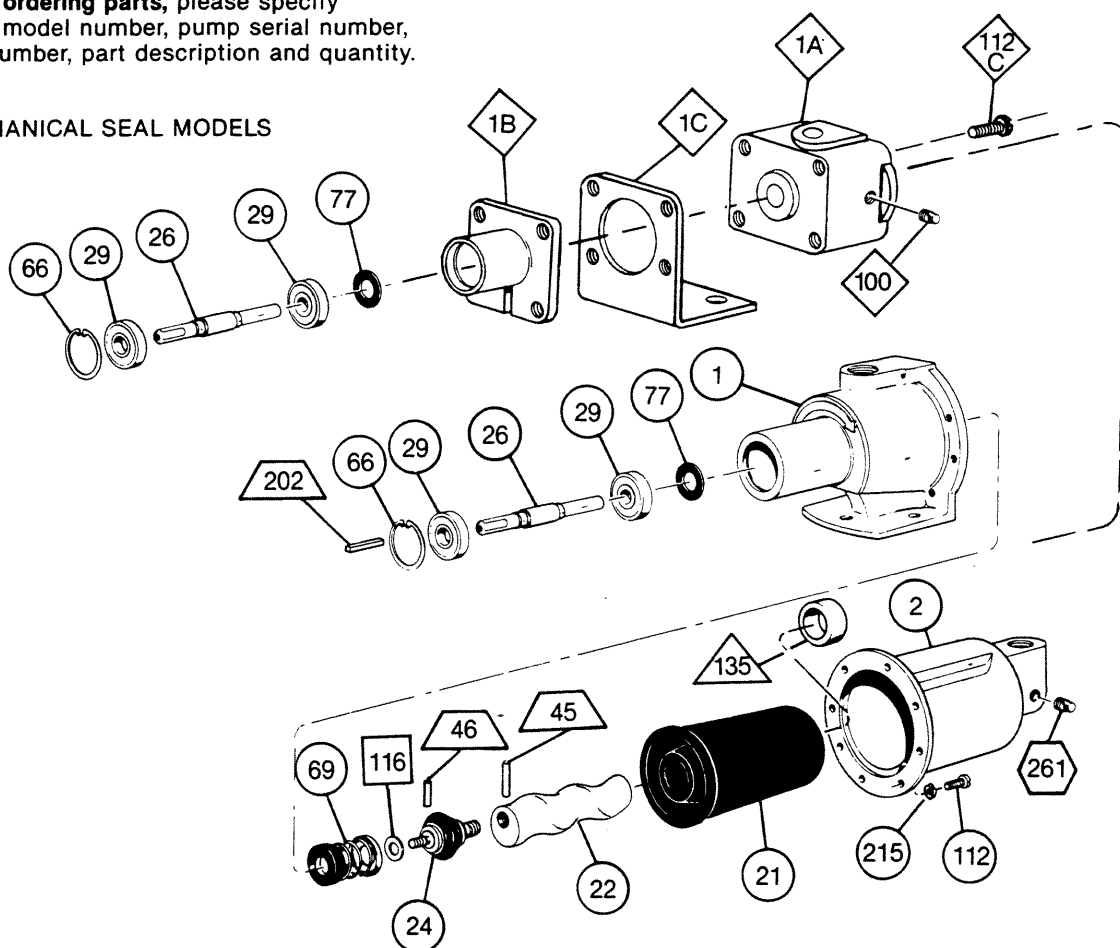
2. Install packing (42) before installing shaft assembly using the following procedure:
 - a. Lubricate each individual ring of packing with a grease that is insoluble in the fluid being pumped.
 - b. Individually assemble each ring of packing loosely in the packing chamber of the pump body (1). Stagger splits on rings. (Four rings, 3/16 inch square required on Model 34411; four rings, 1/4 inch square and two lantern ring halves (57) assembled between two rings on 356 Models).
 - c. Loosely install packing gland (41) on pump body (1) using gland bolts (47).
3. Press shaft assembly into pump body (1) positioning slinger ring (77) between packing gland (41) and bearing end of pump body. Secure the shaft assembly with snap ring (66).
4. Thread flexible joint (24) into shaft (26) in a clockwise direction (RH thread).
5. Thread rotor (22) onto flexible joint (24) in a clockwise direction (RH thread).
6. Slide stator (21) on rotor (22). On 331 and 332 Models, insert rounded end of stator ring (135) into end of stator prior to installing stator on rotor.
7. Secure stator (21) and suction housing (2), with suction port vertically up, to pump body (1) using screws (112).
8. Proceed as in installation instructions.

Note: Adjust newly installed packing as described in maintenance procedure.

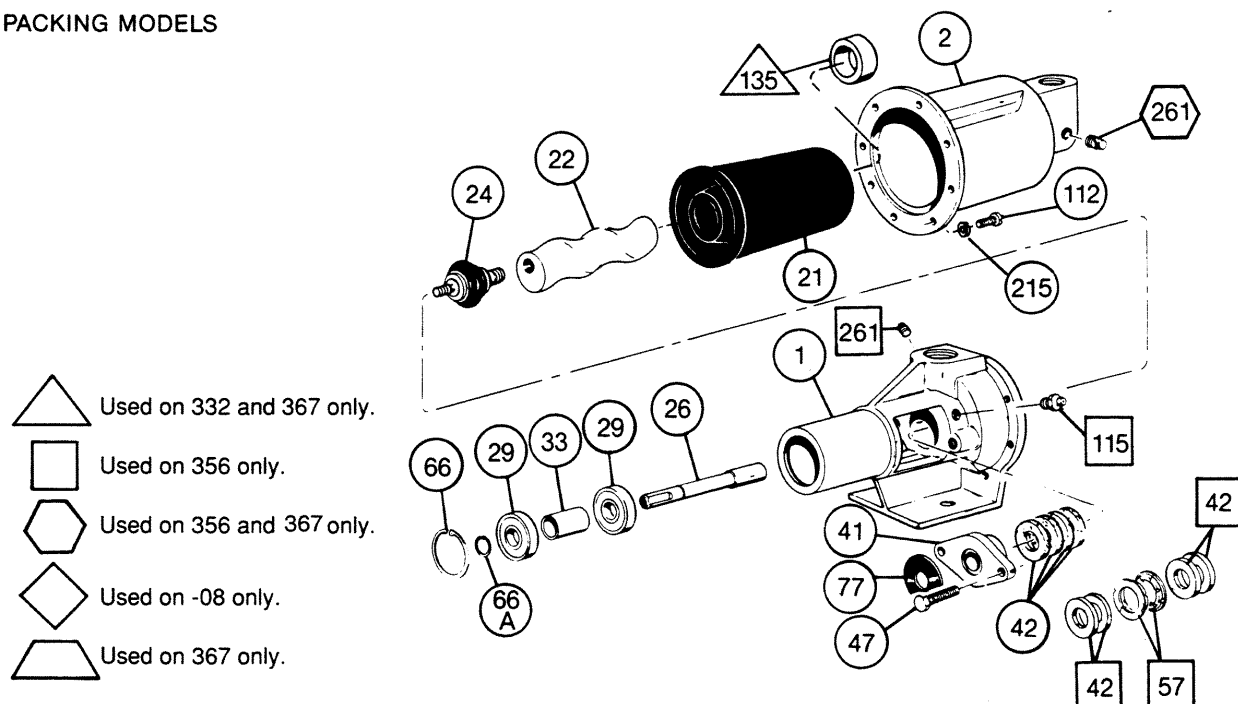
WARNING: Replace belt or coupling guards before reconnecting power.

When ordering parts, please specify
 pump model number, pump serial number,
 part number, part description and quantity.

MECHANICAL SEAL MODELS



PACKING MODELS



PARTS LIST — 331, 332, 333, AND 344 MODELS

Item No.	Description	Mechanical Seal Models			Packing Gland Models
		33101 33201 33301 34401	33104 33204 33304 34404	33108 33208 33308 34408	34411
1	Pump Body	330-1065-002	330-1910-002		340-1000-001
1A	Discharge Housing			340-2362-000	
1B	Bearing Housing			330-4587-000	
1C	Pump Base			340-2369-000	
2	Suction Housing	330-1064-002	330-1911-002	330-4536-000	330-1064-002
*21	Stator	See Stator section below.			
*22	Rotor	See Rotor section below with circled numbers for each series.			
		①	②	①	①
24	Joint	Carbon Steel/NBR 320-1511-000	316 SS/NBR 320-3759-000	Carbon Steel/NBR 320-1511-000	
26	Drive Shaft	320-1499-000	320-2938-000	320-1499-000	320-2448-000
29	Bearing (2 req.)	630-0502-031			
33	Bearing Spacer				320-1900-000
41	Packing Gland				320-0101-004
42	Packing				340-3396-005
47	Gland Bolt				619-1520-161
66	Snap Ring	320-1506-000			
66A	Snap Ring				320-4182000
69	Mechanical Seal	320-2424-000			
77	Slinger Ring	320-6382-000			320-6384-000
100	Pipe Plug (3 req.)				610-0120-021
112	Screws (8 req.)	619-1430-103	320-5968-000	619-0860-081	619-1430-103
112C	Screws (4 req.)			61 9-0890-281	
135	Stator Ring (331 -332 only)	320-7812-000			
215	Lock Washer (8 req.)	320-6464-000			

*Recommended spare parts.

STATORS		Models			
		331	332	333	344
21	Standard Stator, NBR All Models	340-3501-120	340-3502-120	340-3503-120	340-3504-120
21	EPDM Stator	340-3501-320	340-3502-320	340-3503-320	340-3504-320
21	FPM Stator	340-3501-520	340-3502-520	340-3503-520	340-3504-520
ROTORS					
22	① 416SS - All Models	320-2729-000	330-0906-000	320-1394-000	320-1841-000
22	② 316SS - All Models	320-2933-000	320-2942-000	320-2936-000	320-2934-000

See page 8 for Repair/Conversion Kits

PARTS LIST — 356 AND 367 MODELS

Item No.	Description	Mechanical Seal Models		Packing Gland Models		Mechanical Seal Model	
		35601	35604	35611	35613	36701	36704
1	Pump Body	Cast Iron 340-0636-000	316SS 340-1550-000	Cast Iron 350-0420-000	316SS 350-0491-000	Cast Iron 350-0423-000	316SS 350-0423-007
2	Suction Housing	350-0280-000	350-0489-000	350-0280-000	350-0489-000	350-0302-000	350-0302-007
*21	Stator	NBR 340-3505-120		NBR 340-3505-120		NBR 340-3506-120	
22	Rotor	416SS 320-2304-000	316SS 320-4431-000	416SS 320-2304-000	316SS 320-4431-000	416SS 330-2042-000	316SS 330-3077-000
24	Flex Joint	Carbon Steel 320-1583-000	316SS 320-4427-000	Carbon Steel 320-1583-000	316SS 320-4427-000	Carbon Steel 320-1749-000	316SS 320-4436-000
26	Drive Shaft	320-1759-000	320-4430-000	320-2765-000	320-4435-000	330-1805-000	330-1805-015
29	Bearing (2 req.)	630-0552-051				630-0552-061	
33	Bearing Spacer			320-2764-000			
41	Packing Gland			320-0003-004	320-0003-007		
*42	Packing			340-3396-008			
45	Rotor Pin					320-4439-002	
46	Shaft Pin					320-4439-001	
47	Gland Bolt			619-1530-241			
57	Lantern Ring Half**			320-6585-000			
66	Snap Ring	320-1758-000				320-2794-000	
66A	Snap Ring			320-3533-000			
*69	Mechanical Seal	320-3945-000				320-1750-000	
69A	Seal Spacer	320-4434-000					
77	Slinger Ring	320-6383-000		320-6385-000		320-6385-000	
112	Screws (6 req.)	619-1530-161				619-1530-161	
115	Zerk Fitting			320-2503-001			
135	Stator Spacer	330-7594-000					
202	Shaft Key					611-0040-240	
215	Lock Washer (6 req.)	623-0010-411					
261	Pipe Plug	610-0120-011	610-0420-010	610-0120-011	610-0420-010	610-0120-011	610-0420-010

*Recommended spare parts.

**2 Required

See page 8 for Repair/Conversion Kits

REPAIR/CONVERSION KIT NUMBERS

ELASTOMER REPAIR/CONVERSION KITS

Item No.	Description	331 Models			332 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
—	Kit No.	311-9026-000	311-9025-000	311-9054-000	311-9027-000	311-9038-000	311-9055-000
21	• Stator	340-3501-120	340-3501-320	340-3501-520	340-3502-120	340-3502-320	340-3502-520
24	• Joint	320-1511-000†	320-6367-000†	320-4670-000†	320-1511-000†	320-6367-000†	320-4670-000†
69	• Seal	320-2424-000	320-6379-000	320-6501-000	320-2424-000	320-6379-000	320-6501-000
Item No.	Description	333 Models			344 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
—	Kit No.	311-9029-000	311-9028-000	311-9056-000	311-9031-000	311-9030-000	311-9057-000
21	• Stator	340-3503-120	340-3503-320	340-3503-520	340-3504-120	340-3504-320	340-3504-520
24	• Joint	320-1511-000†	320-6367-000†	320-4670-000†	320-1511-000†	320-6367-000†	320-4670-000†
69	• Seal	320-2424-000	320-6379-000	320-6501-000	320-2424-000	320-6379-000	320-6501-000

†316SS/with appropriate elastomer.

‡Carbon steel. NBR kits are available only with carbon steel joints; a 316SS/NBR joint for 331-344 Models is available as 320-3759-000.

Item No.	Description	356 Models			367 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
—	Kit No. (Mech. Seal Models)	311-9033-000	311-9032-000	311-9058-000	311-9060-000	311-9036-000	311-9124-000
21	• Stator	340-3505-120	340-3505-320	340-3505-520	340-3506-120	340-3506-320	340-3506-520
24	• Flex Joint	320-1583-000†	320-6369-000†	320-4671-000†	320-1749-000†	320-6378-000†	320-6515-000†
69	• Seal	320-3945-000	320-6380-000	320-6510-000	320-1750-000	320-6390-000	320-6517-000
45	• Rotor Pins				320-4439-002	320-4439-002	320-4439-002
46	• Shaft Pin				320-4439-001	320-4439-001	320-4439-001
—	Kit No (Packing Gland Models)	311-9035-000	311-9034-000	311-9059-000			
21	• Stator	340-3505-120	340-3505-320	340-3505-520			
24	• Joint	320-1583-000†	320-6369-000†	320-4671-000†			

†316SS/with appropriate elastomer.

‡Carbon steel. NBR kits are available only with carbon steel joints; a 316SS/NBR joint for Model 35604 and 35613 pumps is available as 320-4427-000; a 316SS/NBR joint for model 36704 is available as 320-4436-000.

ABRASION RESISTANT SEALS

Elastomer	Models		
	331-344	356	36701
NBR	3206460000	3206505000	3206511000
EPDM	3206502000	3206506000	3206512000
FPM	3206503000	3206507000	3206513000

NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

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SERVICE MANUAL MOYNO® 500 PUMPS

300 SERIES

30100, 30102, 30104, AND 30105 MODELS

DESIGN FEATURES

Housing: Phenolic
Pump Rotor: Phenolic
Elastomers: NBR, EPDM, FPM
Shaft: Carbon steel
Bearings: Prelubricated, fully sealed ball bearings mounted on shaft and integrally cast in pump body.
Seal: Mechanical (carbon/ceramic)
Mounting: Resilient mountings for quiet operation
Port Size: 1" OD for hose connections

INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings.

Pre-Wetting. Prior to connecting pump, wet pump elements and mechanical seal by adding fluid to be pumped into suction and discharge ports. Turn shaft over several times in a counterclockwise direction to work fluid into elements.

Piping. Install 1" ID hose using adjustable hose clamps. If hose is lengthy, it should be supported to avoid excessive strain on pump housings.

Drive. On belt driven units, adjust belt tension to point of non-slip. Do not overtighten.

On direct drive units, coupling components should be aligned and spaced at least $\frac{1}{16}$ " apart.

Note: Pump shaft diameter is .6267". Pulley or coupling may have to be hand reamed for proper fit.

Check rotation before startup. Rotation must be counterclockwise when facing shaft to prevent rotor unscrewing from shaft.

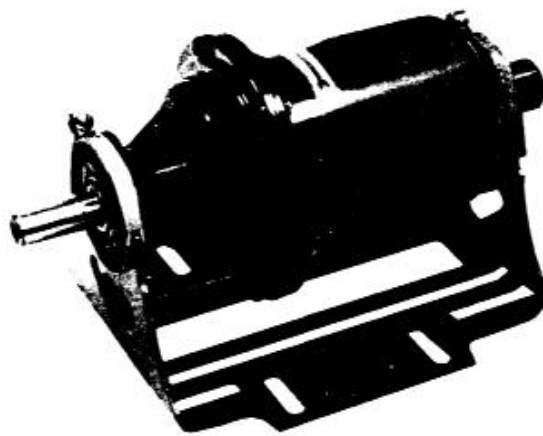
Maximum speed is 1750 rpm.

OPERATION

Self-Priming. With wetted pumping elements, the pump is capable of 25 feet of suction lift when operating at 1750 rpm with hose size equal to port size. Be sure suction lines are air tight or pump will not prime.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity at a given rpm.

Pressure and Temperature Limits. Maximum discharge pressure is 25 psig. Unit is suitable for service at temperatures shown in Table 1.



Storage. Always drain pump for extended storage periods by removing suction and discharge lines, loosening resilient mount clamps and turning discharge port to drain position.

Table 1. Temperature Limits

Elastomer	Temperature Limits
*NBR	10°-160°F
*EPDM	10°-210°F
*FPM	10°-240°F

*NBR = Nitrile

*EPDM = Ethylene-Propylene-Diene Terpolymer

*FPM = Fluoroelastomer

TROUBLE SHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm. Replace belt or coupling guards before re-connecting power.

Failure To Pump.

1. Belt or coupling slip: Adjust belt tension or tighten set screw on coupling.
2. Stator torn; possibly excessive pressure: Replace stator, check pressure at discharge port.
3. Wrong rotation: Rotation must be counterclockwise when facing shaft.
4. Threads in rotor or on shaft stripped: Replace part. Check for proper rotation.
5. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check discharge pressure for 25 psig maximum or obstruction in discharge line.
2. Fluid viscosity too high: Limit fluid viscosity to 20,000 CP or 100,000 SSU.

Viscosity CP	Limit RPM
1-300	1750
300-1,000	1200
1,000-2,000	700
2,000-5,000	350
5,000-10,000	180
10,000-20,000	100

3. Insufficient motor HP: Check HP requirement.

Noisy Operation.

1. Starved suction: Check fluid level, size of piping, and obstructions in pipe.
2. Bearings worn: Replace pump body.
3. Insufficient mounting: Check base for rigidity. Add support if necessary.

Seal Leakage.

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Pump Will Not Prime.

1. Air leak on suction side: Check hose connections.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Disconnect power source.
2. Disconnect suction and discharge hoses. Loosen support clamps (146) and remove pump from base (142).

3. Remove screws (112) which secure suction housing (2) to pump body (1). Remove suction housing (2) and stator (21).
4. Rotor (22) can be removed from shaft by turning in a clockwise direction (LH thread).
5. Remove rubber washer and ceramic seal face from shaft. Lift seal body out of seal bore in pump body. If any parts of the mechanical seal (69) are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.
6. The bearings and shaft assembly is molded into the pump body and should not be removed. Pump body and shaft are a complete part.

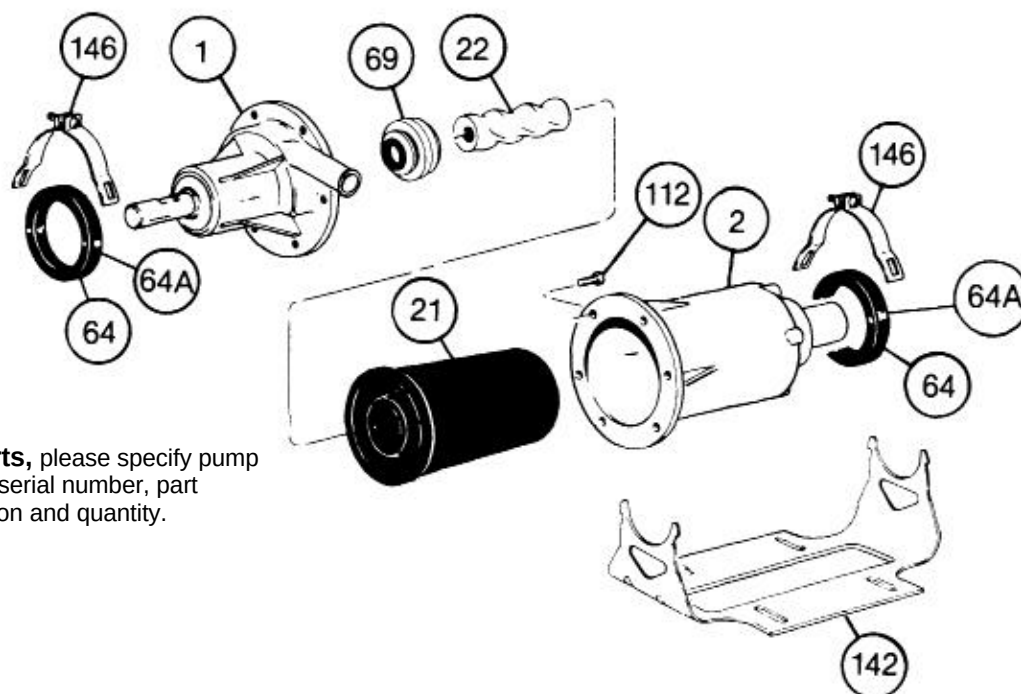
PUMP ASSEMBLY

1. Install mechanical seal (69) by oiling edge of seal body and pressing into seal bore squarely and firmly. Apply light oil to seal faces and slide ceramic face with rubber washer onto shaft. Be sure rubber washer is completely on shaft.

Caution: Do not use oil on EPDM parts. Substitute glycerin or soap and water.

2. Screw rotor (22) onto shaft in a counterclockwise direction (LH thread).
3. Install stator (21) on rotor, seating stator flange in groove on pump body (1).
4. Assemble suction housing (2) to pump body (1). Do not overtighten screws, and apply even pressure on all screws so as not to strip threads in plastic housing.
5. Connect hoses and follow installation instructions.

WARNING: Replace belt or coupling guards before reconnecting power.



When ordering parts, please specify pump model number, pump serial number, part number, part description and quantity.

PARTS LIST

Item No.	Description	Pump Model Number			
		30100	30102	30104	30105
1	Pump Body (Includes Bearing and Drive Shaft)	330-5311-000 (Phenolic)			
2	Suction Housing	330-0945-000			
*21	Stator	NBR 340-3500-120		EPDM 340-3500-320	FPM 340-3500-520
*22	Rotor	320-1486-000 (Phenolic)			
64	Cushion Ring (2 req.)	**	320-1733-000		
64 A	Outer Ring (2 req.)	**	320-1734-000		
*69	Mechanical Seal	320-6976-000		320-6977-000	320-6978-000
112	Screws (6 req.)	320-6936-000			
142	Pump Support	**	330-1697-000		
146	Clamp (2 req.)	**	320-4277-000		

*Recommended spare parts.

**30100 pump is the same as 30102, less base.

NBR = Nitrile

EPDM = Ethylene-Propylene-Diene Terpolymer

FPM = Fluoroelastomer

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Section:

MOYNO® 500 PUMPS

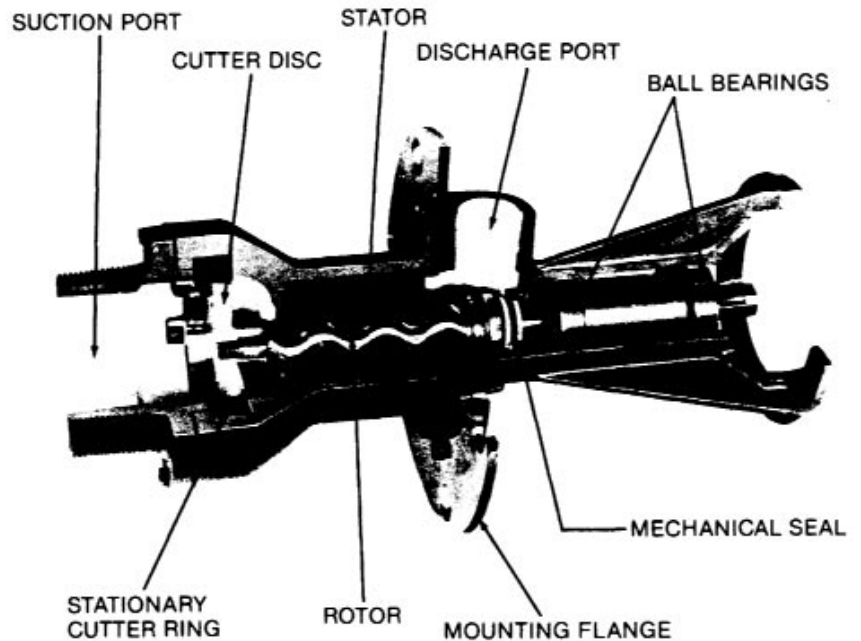
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Date: March 1, 1998

SERVICE MANUAL
MOYNO® 500 PUMPS
400 SERIES GRINDER PUMPS
41502, 42202, 43302, AND 44402 MODELS

DESIGN FEATURES

Housing: Cast iron
Pump Rotor: Chrome plated AISI 416
stainless steel
Pump Stator: NBR (Nitrile)
Shaft: AISI 416 stainless steel
Bearings: Prelubricated, fully sealed
ball bearings
Seal: Mechanical
(carbon/ceramic)
Cutter Ring: Hardened steel
Cutter Disc: Cast iron
Cutter Tips: Carbide



INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings.

Pump is not self priming. Be sure pumping elements are located at or below water line.

Piping. Piping to pump should be self-supporting to avoid excessive strain on pump housings; 4" NPT male connection on suction port, 1-1/4" NPT female connection on discharge port. Be sure suction lines are airtight. A non-clogging type check valve should be used in discharge piping to prevent flow back through pump. Use pipe "dope" or tape to facilitate disassembly and to provide seal.

Drive. Any 56 frame, C-face, 1 HP, 1750 rpm, motor may be selected to meet code or application requirements. Motor is bolted directly to pump flange using hardware supplied with pump.

CAUTION: Use only the rectangular key (202) supplied with hardware kit to prevent damage to shafts.

Pump rotation must be clockwise when facing shaft to prevent rotor unscrewing from shaft. Check direction of rotation before startup.

Maximum speed is 1750 rpm and is the recommended speed for most effective grinding.

OPERATION

Self-Priming. Pump is not self-priming. Pumping elements should be located at or below water line. Be sure suction lines are airtight.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity.

Pressure and Temperature Limits. Maximum discharge pressure is 80 feet of water or 35 psig. Unit is suitable for service at 10° to 160°F.

Storage. Always drain pump for extended storage periods.

TROUBLE SHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

Failure To Pump.

1. Motor shaft turns; pump shaft will not: Check key, collar, and collar screw. Adjust if necessary.
2. Torn stator; possibly excessive pressure: Replace stator, check pressure at discharge port.
3. Wrong rotation: Rotation must be clockwise when facing shaft.
4. Threads in rotor or on shaft stripped: Replace part. Check for proper rotation.
5. Rotor pin sheared at rotor connection: Possibly excessive pressure. Replace parts, check pressure at discharge port.
6. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check discharge pressure for maximum rating given in Table 1. Check for obstruction in discharge pipe.
2. Fluid viscosity too high: Limit fluid viscosity to 100 CP or 500 SSU.
3. Insufficient motor HP: Check HP requirement.

Will Not Start.

1. Low voltage: Check power supply and wiring.
2. Faulty motor: Replace or repair.
3. Grinder section jammed: Rotate drive shaft counterclockwise 1/4 turn to unjam cutters. If pump still will not start, check grinder section for jammed material and remove.

Noisy Operation.

1. Starved suction: Check fluid level, size of piping, and obstructions in pipe.
2. Bearings worn: Replace parts.
3. Insufficient mounting: Mount securely. Reduce vibration induced noise by using a short section of hose on discharge piping.
4. Cutter disc contacts stationary cutter ring: Refer to grinder orientated problem section of guide.

Seal Leakage.

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Grinder Associated Problems.

1. Grinder will not grind: Check for proper rotation. Check condition of cutter tips and cutter ring, replace as required. Cutter ring may be inverted to provide sharp cutting edge.
2. Cutter disc interferes with stationary cutter ring: Check location of cutter ring, adjust as required. Check cutter tips for position, reposition as required. Check for bent shaft. Replace shaft, adjust cutter section and check pressure at discharge port.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Disconnect power source.
 2. Disconnect suction and discharge piping.
 3. Remove screws (112C) holding reducer (9) to stator housing (14). Remove reducer and reducer gasket (83).
 4. Detach cutter tip (439) and cutter clamp (405) assemblies and cutter ring (196) from stator housing (14) by removing cap screws (112D). Lift cutter ring out of stator housing.
 5. Cutter tip (439) can be detached from cutter clamp (405), and cutter disc (438) by removing screw (112A).
 6. Remove cutter disc (438) by turning counterclockwise (RH thread) with drive shaft (26) locked in position. A sharp rap against cutter tip (439) with a block of wood and hammer may be required to loosen cutter disc from drive shaft (26).
 7. Remove screws (112C) holding stator housing (14) to pump body (1). Remove stator housing.
 8. Remove stator (21) by pulling off of rotor (22).
 9. Remove rotor (22) by removing pin (46) from drive shaft (26), twisting rotor may be required, with drive shaft locked in position. A suitable punch may be required to remove pin from drive shaft.
 10. Carefully slide mechanical seal (69) off shaft (26). Carefully pry seal seat out of pump body (1). If any parts of mechanical seal are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.
 11. Free collar (434) on shaft (26) by loosening set screw (435).
 12. Detach motor from pump body (1) by removing screws (112 B).
 13. The bearings (29) and shaft (26) assembly can be removed from pump body (1) after snap ring (66) has been removed. To remove the assembly, lightly tap the shaft at threaded end using a block of wood to protect the threads. The bearings may be pressed off the shaft.
- Note: When replacing bearings, always press on the inner race when assembling to shaft, and on the outer race when pressing bearings into the housings.
14. Adaptor plate (40) and adaptor plate gasket (79) can be removed from pump body by removing screws (112C).

Parts List

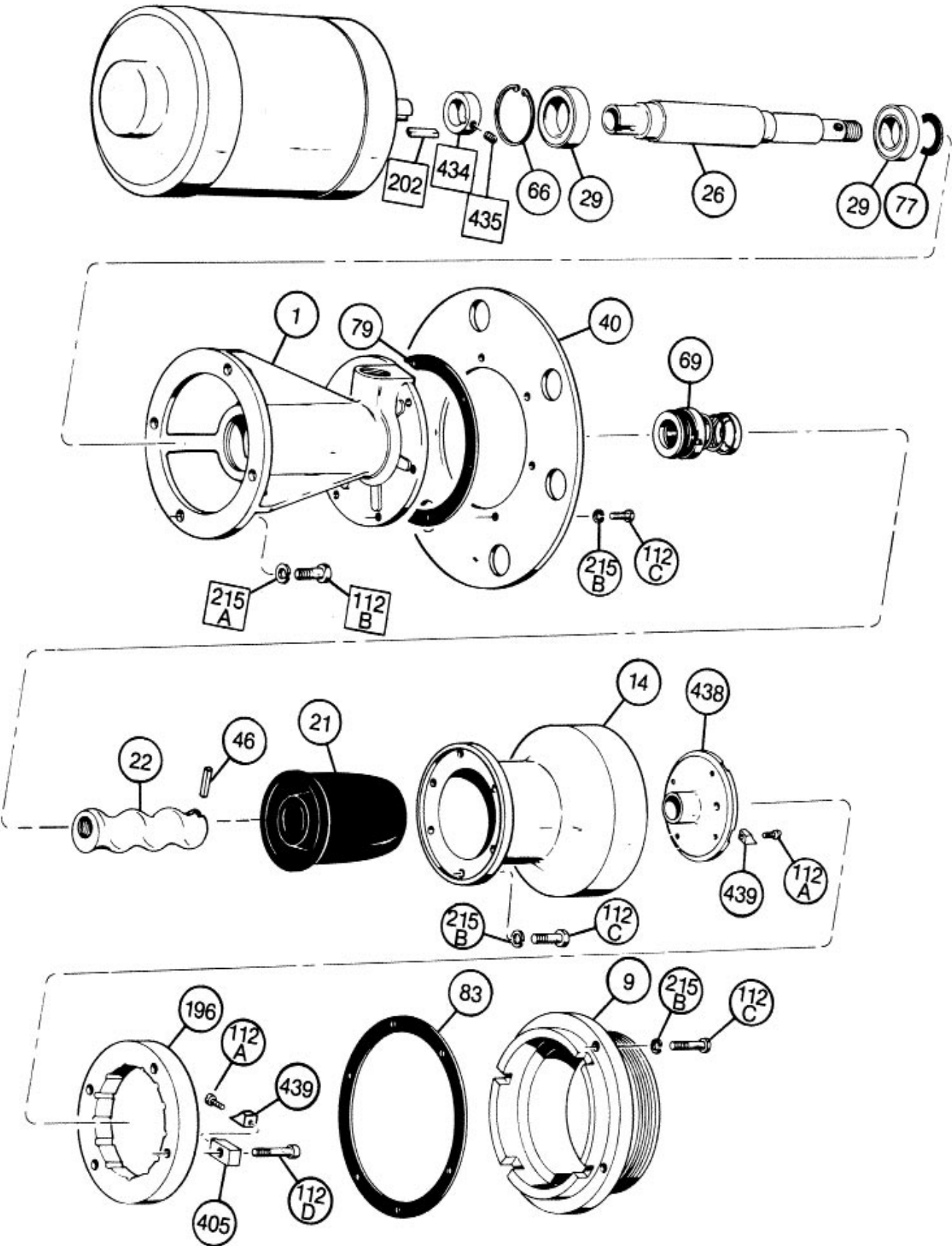
Item No.	Description	Pump Model Numbers			
		†41502	42202	†43302	44402
1	Pump Body	350-0629-000			
9	Reducer	330-4196-000			
14	Stator Housing	350-0618-000			
*21	Stator	340-3501-120	340-3502-120	340-3503-120	340-3504-120
*22	Rotor	330-4605-000	330-4604-000	330-4603-000	330-4602-000
26	Drive Shaft	340-2371-000			
29	Bearing (2 req.)	630-0502-061			
40	Adaptor Plate	330-4201-000			
46	Rotor Pin	320-4486-003			320-4486-004
66	Snap Ring	320-2794-000			
*69	Mechanical Seal	320-6500-000			
77	Slinger Ring	320-6385-000			
79	Adaptor Plate Gasket	320-5888-000			
*83	Reducer Gasket	320-5878-000			
112A	Screw, SS Cap (8 req.)	320-4787-006 (8-32 x 3/8)			
112B	Screw, Hex Hd (4 req.)	619-1530-161 (3/8-16 x 1)			
112C	Screw, SS Hex Hd (18 req.)	320-5615-014 (1/4-20 x 1)			
112D	Screw, SS Cap (4 req.)	320-5395-016 (1/4-20 x 1-1/2)			
196	Cutter Ring	330-4200-000			
202	Key	320-6292-000 (3/16 x 1/4 x 3/4)			
215A	Lock Washer, SS (4 req.)	623-0010-411 (3/8)			
215B	Lock Washer, SS (18 req.)	320-5616-039 (1/4)			
405	Cutter Clamp (4 req.)	320-5887-000			
434	Coupling	320-5811-000			
435	Set Screw	606-0060-053			
438	Cutter Disc	330-4199-000			
*439	Cutter Tip (8 req.)	320-5876-000			

* Recommended spare parts

† Not available as standard model; must be obtained by retrofitting with Repair/Conversion Kit listed below;

REPAIR/CONVERSION KIT NUMBERS

Item No.	Description	Model 41502	Model 43302
—	Kit No.	311-9127-000	311-9128-000
22	• Rotor	330-4605-000	330-4603-000
21	• Stator	340-3501-120	340-3503-120
46	• Pin	320-4486-003	320-4486-003



☐ Mounting Hardware Kit

When ordering parts, please specify pump model number, pump serial number, part number, part description and quantity.

PUMP ASSEMBLY

1. Secure adaptor plate gasket (79) and adaptor plate (40) to pump body (1) using lock washers (215B) and screws (112C).
2. Press bearings (29) on shaft (26), and locate slinger ring (77) near bearing on threaded end of shaft.
3. Press shaft assembly into pump body (1) securing with snap ring (66).
4. Install mechanical seal (69) using the following procedure:
 - a. Clean and oil sealing faces using clean light oil (not grease).
 - b. Oil the outer surface of the seal seat, and push the assembly into the bore in the pump body (1), seating it firmly and squarely.
 - c. After cleaning and oiling the shaft, slide the seal body along the shaft until it meets the seal seat.
 - d. Install seal spring and spring retainer on shaft.
5. Locate pinhole on threaded end of shaft (26) and install rotor (22) on shaft. Align slot on rotor with pin hole and install pin (46).
6. Secure stator (21) and stator housing (14) to pump body using lock washers (215B) and screws (112C).

CAUTION: Be sure to use a thread locking compound on threads of screws (112 and 112C).

7. Attach cutter tips (439) to cutter disc (438) with screws (112A). See Figure 1 for correct position.
8. Screw cutter tip and cutter disc assembly on drive shaft (26) in a clockwise direction (RH thread).
9. Attach cutter tip (439) to cutter clamp (405) using screw (112A). See Figure 2 for correct position.

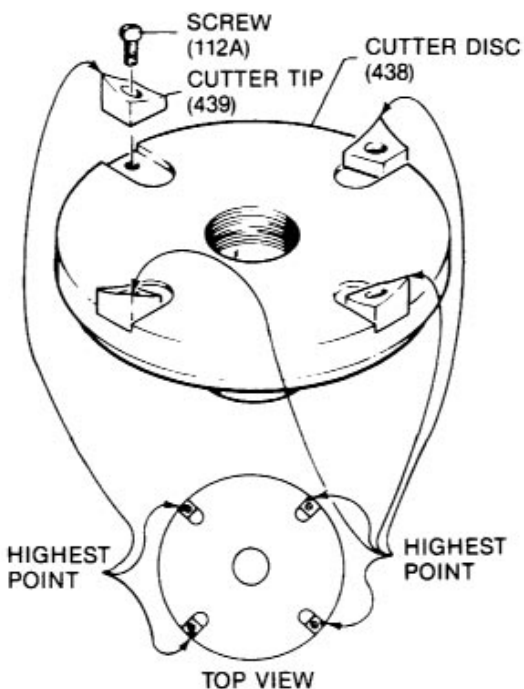


Figure 1

CAUTION: Be sure to use a thread locking compound on threads of screws (112A).

10. Install cutter ring (196) and cutter tip/cutter clamp assemblies using the following procedure:
 - a. Place cutter ring (196) in stator housing (14).
 - b. Position cutter tip/cutter clamp assemblies on cutter ring, screwing screw (112D) finger tight. Cutter tip/cutter clamp assemblies should point to center of shaft.
 - c. Position cutter ring (196) to provide clearance around cutter disc (438), and tighten screws (112D). Check interference between cutter disc and cutter ring by rotating shaft several revolutions. Readjust cutter ring if necessary.
11. Secure reducer gasket (83) and reducer (9) to stator housing (14) using lock washers (215B) and screws (112C). The cast tabs on the reducer (9) should be located in the spaces between the cutter tip/cutter clamp assemblies.
12. Slide coupling (434) with set screw (435) over shaft (26).
13. Secure motor (70) to pump body (1) using lock washers (215A) and screws (112B).
14. Align keyways in motor and pump shafts, and insert key (202).

CAUTION: Use only the rectangular key (202) supplied with hardware kit to prevent damage to shafts.

15. Secure key (202) by tightening set screw (435) in coupling (434) against the key.
16. Proceed as in installation instructions.

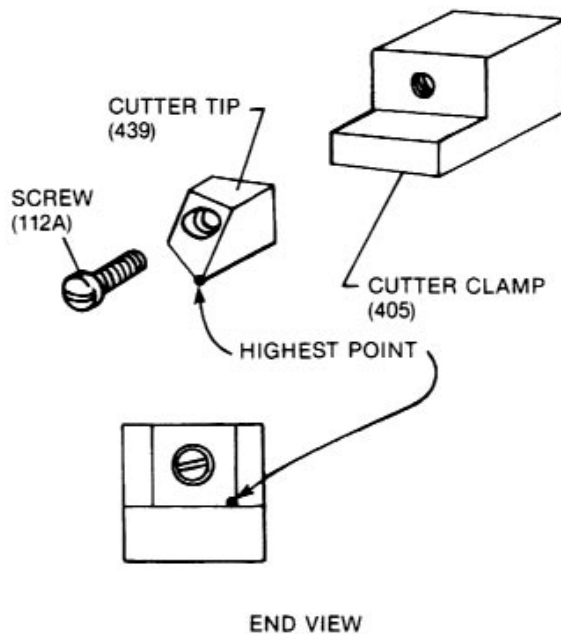


Figure 2

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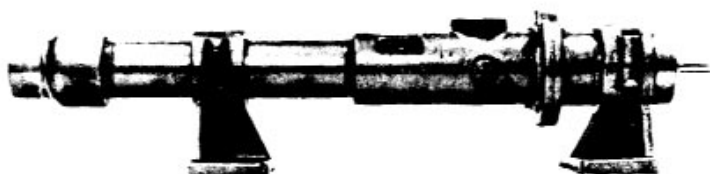
MOYNO® 500 PUMPS

600 SERIES

**60301, 61001, 62201, 63301, 65501, 60311,
61011, 62211, 63311, AND 65511* MODELS**

DESIGN FEATURES

Housing: Cast iron
 Pump Rotor: Heavy duty chrome plated
 AISI 416 stainless steel
 Pump Stator: NBR (Nitrile)
 Shaft: AISI 416 stainless steel
 Bearings: Prelubricated, fully sealed ball
 bearings
 Seal: Mechanical or packing
 Flexible Joint: Prelubricated and sealed
 *Packing Models available through retrofit kit. See
 page 6.
 Note: Alternate elastomers available. Refer to
 Repair/Conversion kit numbers. page 6.



INSTALLATION

Mounting. Provide the proper alignment between the pump and drive by mounting both to a common flat base. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings. Loosen screws on body support and stator support to rotate pump to desired position.

Pre-Wetting. Prior to connecting pump, wet pump elements and mechanical seal or packing by adding fluid to be pumped into suction port. Turn shaft over several times in a clockwise direction when viewed from the shaft end to work fluid into pump elements.

Piping. Piping to pump should be self-supporting to avoid excessive strain on pump housings. See Table 1 for suction and discharge port sizes of each pump model. Use pipe 'dope' or tape to facilitate disassembly and to provide seal.

Drive. On belt driven units, adjust belt tension to point of non-slip. Do not overtighten.

On direct drive units, coupling components should be aligned and spaced at least 1/16" apart.

Pump rotation must be clockwise when facing shaft.

Check direction of rotation before startup.

Maximum speed is 1750 rpm.

Water Flush of Packing (Packing Models Only).

The packing may be either grease lubricated through a grease fitting in the stuffing box or have plumbing connected to the housing to allow a water flush.

When the material being pumped is abrasive in nature, it may be advantageous to flush the packing to prevent leakage under packing and excessive shaft wear.

Clean water can be injected through a 1/8" NPT tapped hole that normally houses the grease fitting for lubricating the packing. The water can be permitted to leak axially along the shaft in either direction.

OPERATION

Self-Priming. With wetted pumping elements, the mechanical seal model pump is capable of 15 feet of suction lift when operating at 1750 rpm with pipe size equal to port size. The packing model is capable of 25 feet of suction lift.

DO NOT RUN DRY. Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity.

Pressure and Temperature Limits. See Table 1 for maximum discharge pressure of each model. Unit is suitable for service at 10° to 160°F with NBR (Nitrile), and to 210°F with EPDM (Ethylene-Propylene-Diene Terpolymer) elastomers.

Storage. Always drain pump for extended storage periods using pipe plug in suction housing.

Table 1. Pump Data

Pump Model	60301 60311	61001 61011	62201 62211	63301 63311	65501 65511
Suction Port (NPT)	3/4	3/4	3/4	1-1/4	1-1/4
Discharge Port (NPT)	1/2	3/4	3/4	1-1/4	1-1/4
Discharge Pressure (psig)	600	600	300	150	60
*Minimum Starting Torque (IN-LB)	95	180	90	70	60

*Based on water at ambient temperature.

TROUBLE SHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

Failure To Pump.

1. Belt or coupling slip: Adjust belt tension or tighten set screw on coupling.
2. Wrong rotation: Rotation must be clockwise when facing shaft.
3. Excessive suction lift, vacuum or obstruction in suction piping.
4. Flexible joint broken; possible excessive pressure:
Replace joint, check pressure at discharge port.

Will Not Start.

1. Insufficient horsepower: Check motor starting torque for minimum model starting torque given in Table 1.
2. Low voltage: Check power supply.

Pump Overloads.

1. Excessive discharge pressure: Check discharge pressure for maximum rating given in Table 1 above. Check for obstruction in discharge pipe.
2. Excessive temperature: Check fluid temperature for a maximum of 160°F.
3. Belt or coupling slip: Check pressure at discharge port.
4. Loose bond in stator: High temperature and caustics will cause bond between rubber and tube to fail. Replace stator, check fluid temperature and pressure at discharge port.
5. Fluid viscosity too high: Recommended maximum RPM.

Viscosity CP	Limit RPM
1-300	1750
300-1,000	1200
1,000-2,000	700
2,000-5,000	350
5,000-10,000	180
10,000-20,000	100

6. Motor connected incorrectly: Motor wired for 230 VAC, connected to 115 VAC service.

Noisy Operation.

1. Starved suction: Check fluid supply, length of suction line, and obstructions in pipe.
2. Bearings worn: Replace parts; check alignment, belt tension, pressure at discharge port.
3. Broken flexible joint: Replace part; check pressure at discharge port.

4. Insufficient mounting: Mount to be secure to firm base. Vibration induced noise can be reduced by using mount pads and hose on suction and discharge ports.

Poor Performance.

1. Low pressure; worn stator: Replace stator: check for excessive abrasive material in fluid, check for run dry condition.

Mechanical Seal Leakage (Mechanical Seal Models Only).

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

Packing Leakage (Packing Models Only).

1. Leakage at startup: Adjust packing as outlined in maintenance instructions.

Note: Slight leakage is necessary for lubrication of packing.

2. Persistent leakage: Packing rings and/or shaft may be worn. Replace parts as required.

Pump Will Not Prime.

1. Air leak on suction side: Check pipe connections. Suction lift over 15 ft. will cause seal faces to open.
2. Defective mechanical seal: Inspect and repair as necessary.

MAINTENANCE

General. These pumps have been designed for a minimum of maintenance, the extent of which is routine lubrication and adjustment of packing. The pump is one of the easiest to work on in that the main elements are very accessible and require few tools to disassemble.

Packing Lubrication (Packing Models Only). The zerk fitting on the top of the packing housing leads to the lantern ring halves in the mid-section of the packings. At least once a week, inject a small quantity of good quality grease, such as MPG-2 Multi Purpose Grease (DuBois Chemical), or equivalent, into the zerk fitting to lubricate the packings.

Packing Adjustment (Packing Models Only). Packing gland attaching nuts should be evenly adjusted so they are little more than finger tight. Over-tightening of the packing gland may result in premature packing failure and possible damage to the shaft and gland.

When the packing is new, frequent minor adjustments are recommended for the first few hours of operation in order to compress and seat the packing. Be sure to allow slight leakage for lubrication of packing.

When excessive leakage can no longer be regulated by tightening the gland nuts, remove and replace the packings in accordance with the DISASSEMBLY and REASSEMBLY instructions. The entire pump need not be disassembled to replace the packings.

Bearing Lubrication. The prelubricated, fully sealed bearings do not require additional lubrication.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Disconnect power source.
2. Remove suction and discharge piping.
3. Reducer (9) may be removed from stator (21) by unscrewing in a counter-clockwise direction (RH thread).
4. Remove stator support screws (112B) and remove top half of stator support(s) (38).
5. Stator (21) may be removed from suction housing (2) by unscrewing in a counter-clockwise direction (RH thread). Use a strap wrench on stator to avoid crushing with a pipe wrench. Pull stator (21) from rotor (22). To assist removal of stator, hold shaft (26) from turning and turn stator clockwise when facing suction housing after disengaging thread.
6. Remove screws (112) holding suction housing (2) to bearing housing (1). Remove suction housing and suction housing gasket (83).
7. The rotor (22) and flexible joint (24) may be removed using the following procedure (do not bend joint more than 15 degrees).
 - a. Remove rotor (22) from flexible joint (24) by using a punch to remove rotor pin (46). Support joint while removing pin.

Note: On Model 603 only, remove adaptor (264) from rotor by turning in a counter-clockwise direction (RH Thread.)

- b. Remove joint (24) from shaft (26) by using a punch to remove shaft pin (46).
8. **Mechanical Seal Models.** Carefully slide mechanical seal (69) off shaft (26). Carefully pry seal out of bearing housing (1). If any parts of mechanical seal are worn out or broken, the complete assembly should be replaced. Seal components are matched parts and are not interchangeable.
9. **Packing Models.** Remove bolts attaching packing gland housing (3) to bearing housing (1) and remove packing gland housing. Disconnect drive shaft extension (27) by using a punch to remove shaft pin (46).

The packing (42) can be removed without removing the shaft (27) using the following procedure:

- a. Remove gland bolts (47).
- b. Slide gland (41) away from packing (42).
- c. Pull out packing (42) and lantern ring halves (57) using a packing-removing tool.

Note: If shaft (27) has been removed, the packing can be removed easily by pushing out from pump side of packing gland housing (3).

10. The bearings (29 and 30) and shaft (26) assembly can be removed from bearing housing (1) after snap ring (66) has been removed. To remove the shaft assembly, lightly tap the shaft at the flexible joint connection end using a block of wood to protect the shaft. The bearings may be pressed off the shaft.

PUMP ASSEMBLY

1. Press radial bearing (29) and thrust bearing (30) on shaft (26), and locate slinger ring (77) on the shaft near the radial bearing.

Note: When replacing bearings, always press on the inner race when assembling to shaft, and on the outer race when pressing bearings into the housings.

2. Press shaft assembly into bearing housing (1) securing with snap ring (66).
3. **Mechanical Seal Models.** Install mechanical seal (69) using the following procedure:
 - a. Clean and oil sealing faces using a clean light oil (not grease).

Caution: Do not use oil on EPDM parts.

Substitute glycerin or soap and water.

- b. Oil the outer surface of the seal seat, and push the assembly into the seal bore in the bearing housing (1), seating it firmly and squarely.
 - c. After cleaning and oiling shaft, slide the seal body along the shaft until it meets the seal seat.
 - d. Install seal spring and spring retainer on shaft.
4. **Packing Models.** Install packing before installing shaft assembly using the following procedure:
 - a. Lubricate each individual ring of packing (42) with a grease that is insoluble in the fluid being pumped.
 - b. Individually assemble each ring of packing loosely in the stuffing box of the packing gland housing (3). Seven rings of 1/4" square plus 2 lantern ring halves required—assemble with 3 rings, 2 lantern ring halves (57), followed by 4 rings. Stagger split in rings.
 - c. Loosely install packing gland (41) in packing gland housing (3) using gland bolts (47).
 - d. Attach drive shaft extension (27) to drive shaft (26) by installing pin (46). Support shaft during installation.
 - e. Install slinger ring (77) on drive shaft extension (27).
 - f. Slide packing gland housing (3) on drive shaft extension, and attach to bearing housing with bolts (112).
5. The flexible joint (24) and rotor (22) may be installed using the following procedure (do not bend joint more than 15 degrees):

Note: On model 603 only, pin adaptor (264) to flexible joint (24) with rotor pin (46), then thread rotor (22) on adaptor by turning clockwise (RH Thread.)

- a. Pin flexible joint (24) to shaft (26) using shaft pin (46).
 - b. Pin rotor (22) to joint using rotor pin (46). Support joint while installing pin.
6. Secure suction housing gasket (83) and suction housing (2) to bearing housing (1) using lock washers (215) and screws (112).
7. Screw reducer (9) on stator (21) in a clockwise direction (RH thread).

Note: Apply pipe "dope" on all pipe threads before assembly.

PARTS LIST

Item No.	Description	Pump Model Number				
		60301 60311	61001 61011	62201 62211	63301 63311	65501 65511
1	Bearing Housing	330-3552-000				
2	Suction Housing	330-2112-001			330-2112-003	
‡3	Packing Housing	‡340-2368-000				
9	Reducer	320-6110-000	320-1414-004		320-6539-000	320-6539-000
*21	Stator	320-6108-006	320-5466-006	320-3902-004	330-2608-002	330-2612-001
*22	Rotor	330-4606-000	330-4607-000	330-4608-000	330-4609-000	330-4610-000
24	Flexible Joint	320-3944-000				
26	Drive Shaft	330-3553-000				
‡27	Drive Shaft Extension	‡330-4586-000				
29	Radial Bearing	630-0503-051				
30	Thrust Bearing	630-0503-051				
37	Body Support	330-3554-000				
38	Stator Support	330-4461-000			330-0413-000	
‡41	Packing Gland	‡320-0003-004				
‡42	Packing	‡340-3396-008				
46	Rotor Pin/Shaft Pin (3 req.)	320-4486-003				
‡47	Gland Bolt (2 req.)	‡619-1530-241				
‡57	Lantern Ring Half (2 req.)	‡320-6585-000				
66	Snap Ring	320-2794-000				
@69	Mechanical Seal	@320-3945-000				
71	Stator Support Bushing (2 req.)	320-5306-000				
77	Slinger Ring	320-6384-000				
*83	Suction Housing Gasket	320-3028-000				
@112	Screw (4 req.)	@619-1520-161				
‡112	Screw (8 req.)	‡619-1520-161				
112A	Screw (2 req.)	619-1530-281				
112B	Screw (2 req.)	@619-1520-163			619-1530-241	
		‡619-1520-363				
‡115	Zerk Fitting	‡320-2503-001				
162	Support Shim	‡320-0077-003				
202	Shaft Key	611-0030-200				
@215	Lock Washer (4 req.)	@623-0010-401				
‡215	Lock Washer (8 req.)	‡623-0010-401				
261	Pipe Plug	610-0120-021				
264	Rotor Adaptor	320-6388-000				
265	Stator Adaptor	320-6389-001				

‡ Use only on Packing Gland Models (Model No. ends with 11)

@ Use only on Mechanical Seal Models (Model No. ends with 01).

* Recommended spare parts.

REPAIR/CONVERSION KIT NUMBERS (EPDM ELASTOMER)

Item No.	Description	Pump Models				
		603	610	622	633	655
—	Kit No.	311-9129-000	311-9130-000	311-9131-000	311-9132-000	311-9133-000
21	• Stator	320-6470-006	320-6471-006	320-6472-004	320-6473-002	320-6474-001
69	• Seal	320-6380-000				
24	• Joint	320-6523-000				

**REPAIR/CONVERSION KIT NUMBERS
(ABRASION RESISTANT SEAL)**

Description	All Mechanical Seal Models Only
NBR Kit No.	320-6505-000
EPDM Kit No.	320-6506-000

NBR = Nitrile

EPDM = Ethylene Propylene Diene Terpolymer

**REPAIR/CONVERSION KIT NUMBERS
(PACKING GLAND)**

Item No.	Description	All Packing Gland Models
—	Kit No.	311-9049-000
3	• Packing Housing	340-2368-000
27	• Drive Shaft Extension	330-4586-000
41	• Packing Gland	320-0003-104
42	• Packing Set	340-3351-008
46	• Shaft Pin (3 req.)	320-4486-003
47	• Gland Bolt (2 req.)	619-1530-241
57	• Lantern Ring Half (2 req.)	320-6385-000
112	• Screw (4 req.)	619-1520-161
115	• Zerk Fitting	220-2503-001
215	• Lock Washer (4 req.)	623-0010-401

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Section:

MOYNO® 500 PUMPS

Page: 1 of 4

Date: March 2002

SERVICE MANUAL

MOYNO® 500 PUMPS

SANITARY/HYGIENIC MOTORIZED

331, 332, 333 AND 344 MODELS

SANITARY MODELS

These pumps include housings polished to a #4 finish both inside and out. The Durametallic FRO mechanical seal has carbon/ceramic faces. The elastomers meet the FDA requirement for food contact. These pumps meet 3A requirements. The universal joint may be dismantled for cleaning.

HYGIENIC MODELS

These pumps provide the quick disassembly features of the sanitary version for easy cleaning. The housings are 316 stainless steel construction, however they are not polished. These pumps utilize rubber-covered universal joints. The stators are available in non-FDA nitrile, EPDM and fluoroelastomers. The mechanical seals are rubber bellows type with carbon/ceramic faces.

INSTALLATION

Mounting Position. Pump may be mounted in any position. When mounting vertically, it is necessary to keep the motor above the pump to prevent possible seal leakage into the bearings.

Pre-Wetting. Prior to connecting the pump, wet the pump elements and mechanical seal by adding fluid to be pumped into suction and discharge ports. Turn the pump over several times in a clockwise direction to work fluid into the pump elements.

Piping. Piping to the pump should be self-supporting to avoid excessive strain on pump housings.

Electrical. Follow the wiring diagram on the motor nameplate or inside the terminal box for the proper connections. The wiring should be direct and conform to local electrical codes. Check power connections for proper voltage. Voltage variations must not exceed $\pm 10\%$ of nameplate voltage. The motor is provided with internal automatic overload protection.

To prevent damage to the pump, pump rotation must be clockwise when facing the pump from the motor end.

OPERATION

Self-Priming. With wetted pumping elements, the pump is capable of 25 feet of suction lift with pipe size equal to



port size. Be sure suction lines are air tight or the pump will not self prime. Self-priming capabilities will vary due to fluid viscosity.

DO NOT RUN DRY. The unit depends on liquid pumped for lubrication. For proper lubrication, the flow rate should be at least 10% of rated capacity.

Pressure and Temperature Limits. See Table 1 for maximum discharge pressure of each model. The unit is suitable for service at temperatures shown in Table 2.

Storage. Always drain the pump for extended storage periods by removing the suction housing and stator.

Caution: Suction pressure should never be greater than discharge pressure.

Table 1. Pump Data

Pump Models	331	332	333	344
Discharge Pressure (psig) (maximum)	150	100	50	40

Table 2. Temperature Limits

Elastomer	Temperature Limits
*NBR (Nitrile)	10°-160°F
*EPDM	10°-210°F
FPM (Fluoroelastomer)	10°-240°F

*FDA Food Grade on Sanitary Models. FDA Fluoroelastomer not currently available. Call factory.

TROUBLESHOOTING

WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system prior to disassembly. Failure to do so could lead to electric shock or serious bodily harm.

Failure To Pump.

1. Motor will not start: Check the power supply. Voltage must be $\pm 10\%$ of nameplate rating when the motor is in locked rotor condition. Check for faulty capacitor on 1-phase models.

2. Motor runs and thermally kicks out: Check for excessive discharge pressure. Check for defective centrifugal switch on 1-phase models. Increase ventilation to motor. Do not use less than #14 wire size.

3. Stator torn; possible excessive pressure: Replace stator; check pressure at discharge port.

4. Flexible joint broken; possible excessive pressure: Replace joint, check pressure at the discharge port.

5. Wrong rotation (3-phase only): Rotation must be clockwise when facing pump from motor end. Reverse the connections of any two line leads to the motor.

6. Excessive suction lift or vacuum.

Pump Overloads.

1. Excessive discharge pressure: Check pressure at discharge port for maximum ratings given in Table 1.

2. Fluid viscosity too high: Limit fluid viscosity to 100 CP or 500 SSU.

Noisy Operation.

1. Excessive suction lift or vacuum: Maximum suction lift is 25 feet for water.

2. Suction line too small: Check pipe size. Be sure lines are free from obstructions.

3. Pump cavitates: Pump speed is 1725 rpm. Viscosity of fluid should not exceed 100 CP or 500 SSU.

4. Flexible joint worn: Replace joint. Check pressure at the discharge port.

5. Insufficient mounting: Mount securely to a firm base. Vibration induced noise can be reduced by using mount pads.

Seal Leakage.

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.

2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace the seal.

Pump Will Not Prime.

1. Air leak on suction side: Check pipe connections.

PUMP DISASSEMBLY

WARNING: Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Remove suction and discharge piping.

2. Remove clamp (112) holding suction housing (2) to discharge housing (1). Remove suction housing (2) and stator (21).

3. Remove rotor (22) from flexible joint (24) by turning counterclockwise (RH thread).

4. Flexible joint (24) can be removed from motor shaft by using a 3/16 Allen wrench in end of joint and turning counterclockwise. Sanitary joints can be further disassembled by removing the snap rings, allowing the pins to be removed.

5. Slide mechanical seal (69) off motor shaft.

6. Remove discharge housing (1) from adapter flange (12) by removing screws (112B).

7. Carefully pry seal out of discharge housing (1). If any parts of mechanical seal are worn or broken, the complete seal assembly should be replaced. Seal components are matched parts and are not interchangeable.

8. Remove adapter flange (12) from motor (70) by removing screws (112A).

9. Remove slinger ring (77).

PUMP ASSEMBLY

1. Install slinger ring (77).

2. Attach adapter flange (12) to motor housing using screws (112A).

3. Attach discharge housing (1) to adapter flange (12) using screws (112B). Be sure to center seal bore on shaft.

4. Install mechanical seal (69) in discharge housing (1) using the following procedure:

a. Clean and lubricate sealing faces using clean vegetable oil (not grease).

Caution: Do not use oil on EPDM parts. Substitute glycerin, soap and water, or approved lubricate.

b. Lubricate outer surfaces of the seal seat, and push assembly over the motor shaft and into the discharge housing (1) seating it firmly and squarely.

c. After cleaning and lubricating the shaft, slide the seal body along the motor shaft until it meets the seal seat.

d. Install seal spring and spring retainer on shaft.

5. Assemble sanitary joint by sliding center section between two ends. Insert pins and retain with snap rings. Thread flexible joint (24) into motor shaft in a clockwise direction (RH thread). Tighten with 3/16 Allen wrench.

6. Thread rotor (22) onto flexible joint (24) in a clockwise direction (RH thread).

7. Slide stator (21) on rotor (22). On 331 & 332 models, insert rounded end of stator ring (135) into end of stator prior to installing stator on rotor.

8. Secure stator (21) and suction housing (2) to discharge housing (1) using clamp (112).

9. Lubricate rotor and stator by filling suction housing and discharge housing with fluid to be pumped.

10. Connect suction and discharge piping and power source.

PARTS LIST

To determine part numbers for all parts except standard motors, enter table with item number from pump illustration. Then locate part number under applicable model number (first three digits). Parts listed down the center are applicable to all pump models.

Item No.	Pump Model Numbers				
	Description	331	332	333	344
1	Discharge Housing	3403921007 Sanitary Models, 3403922007 Hygienic Models			
2	Suction Housing	3403919007 Sanitary Models, 3403920007 Hygienic Models			
12	Adapter	3308809000			
*22	Rotor 316 SS, Hygienic	3202933000	3202942000	3202936000	3202934000
*22	Rotor 316 SS, Sanitary	3208576000	3208577000	3208578000	3208579000
70	Standard Motor, Hygienic	3304529003- .5HP, 115/230V, 1PH, TEFC			
70	Standard Motor, Sanitary	3308807003- .5HP, 115/230V, 1PH, Washdown duty			
70	Motor DC, Hygienic	3308808000 .5HP, 90VDC, TENV			
70	Motor DC, Sanitary	3308808003 .5HP, 90VDC, TENV, Washdown			
77	Slinger Ring	3206382000			
112	Clamp	3621775000			
135	Stator Ring, Hygienic	3207812000			—
135	Stator Ring, Sanitary	3621774001			—
137	Gasket .62 OD	3308806101 Nitrile, 3308806301 EPDM, 3308806501 FPM			
140	Gasket .78 OD	3308806102 Nitrile, 3308806302 EPDM, 3308806502 FPM			
141	Seal Driver	3308801015 Sanitary only			

PARTS LIST, SANITARY MODELS

Item No.	Description	Sanitary 331 Models			Sanitary 332 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
*21	• Stator	3403501110	3403501300	3403501520	3403502110	3403502300	3403502520
*24	• Joint Assy.	3308810017	3308810017	3308810017	3308810017	3308810017	3308810017
*69	• Seal	3208580000	3208581000	3208582000	3208580000	3208581000	3208582000
Item No.	Description	Sanitary 333 Models			Sanitary 344 Models		
		NBR	EPDM	FPM	NBR	EPDM	FPM
*21	• Stator	3403503110	3403503300	3403503520	3403504110	3403504300	3403504520
*24	• Joint Assy.	3308810017	3308810017	3308810017	3308810017	3308810017	3308810017
*69	• Seal	3208580000	3208581000	3208582000	3208580000	3208581000	3208582000

* Recommended Spare Parts

NBR = Nitrile (FDA Food Grade)

EPDM = Ethylene-Propylene-Diene Terpolymer (FDA Food Grade, not suitable for 3A or dairy requirements)

FPM = Fluoroelastomer (Food Grade not currently available. Call factory)

PARTS LIST, HYGIENIC MODELS

Item No.	Hygienic 331 Models				Hygienic 332 Models		
	Description	NBR	EPDM	FPM	NBR	EPDM	FPM
*21	• Stator	3403501120	3403501320	3403501520	3403502120	3403502320	3403502520
*24	• Joint	3208574001	3208574003	3208574005	3208574001	3208574003	3208574005
*69	• Seal	3202424000	3621792000	3206501000	3202424000	3621792000	3206501000
Item No.	Hygienic 333 Models				Hygienic 344 Models		
	Description	NBR	EPDM	FPM	NBR	EPDM	FPM
*21	• Stator	3403503120	3403503320	3403503520	3403504120	3403504320	3403504520
*24	• Joint	3208574001	3208574003	3208574005	3208574001	3208574003	3208574005
*69	• Seal	3202424000	3621792000	3206501000	3202424000	3621792000	3206501000

* Recommended Spare Parts

NBR = Nitrile

EPDM = Ethylene-Propylene-Diene
Terpolymer

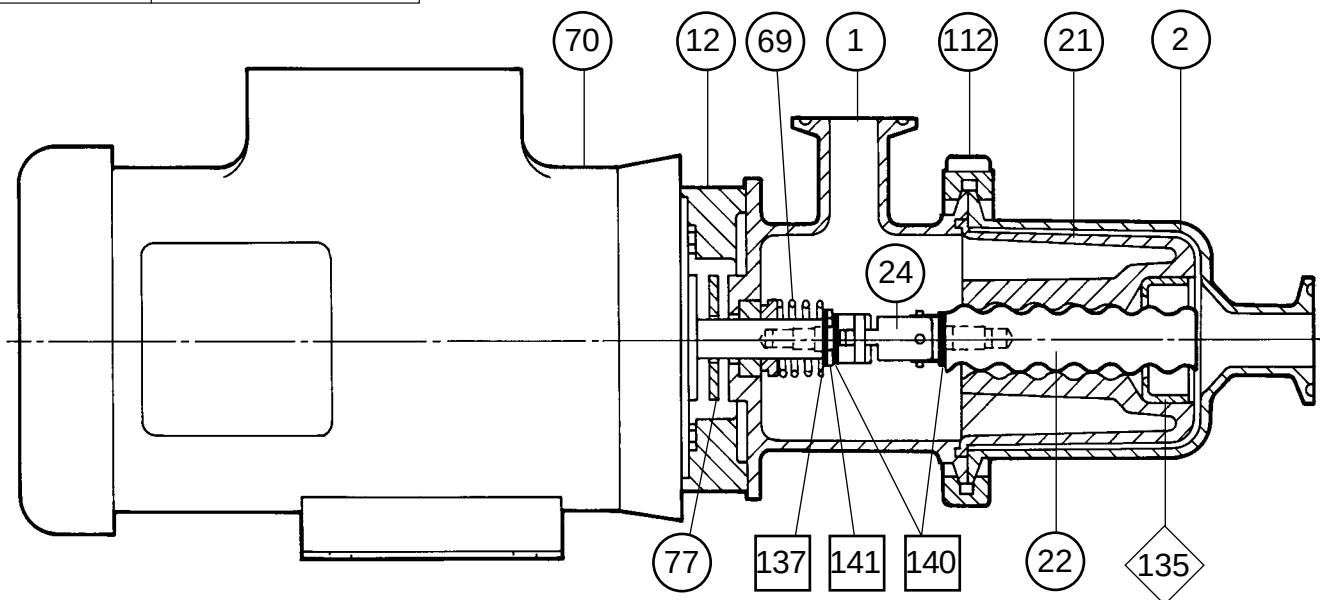
FPM = Fluoroelastomer

ABRASION-RESISTANT SEALS
(Hygienic only)

Sanitary Joint Assy.		
Assy. No. 3308810017		
P/N	Description	Qty.
3207314015	Pin	2
3208575015	Snap Ring	2
3308802017	Joint End	2
3308803017	Joint Center	1

Required Hardware, Not Shown		
P/N	Description	Qty.
3206715007	Screw	4
6230012410	Lock Washer	4
6191522160	Screw	4
6230012400	Lock Washer	4

Elastomer	All 331-344 Models
NBR	3206460000
EPDM	3206502000
FPM	3206503000



When ordering parts, please specify pump model number, pump serial number, part number, part description and quantity.



- Use only on 331 & 332 Models.



- Use only on Sanitary Models.

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